



**Mini Operator's Panel
Reference Manual**

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1. Introduction

The Mini Operator's Panel is based on a combined keypad and LED display, which has an RS485 serial port which can plug in to the auxiliary serial port of a PTS. Software running on the PTS allows the operator to control the operation of the machine and access status information etc. using the panel. This manual describes the operation of the panel and how it can be configured by the user to suit his application.

This manual describes version 1.7 of the Mini Operator's Panel software which is available with version 1.8.5 or later of the PTS.

It is important to note that the Mini Operator's Panel is designed to be located relatively close to the host Quin PTS controller and that the data transmission, at 9600 baud, is sensitive to high levels of electrical noise. The panel should be installed in an environment protected from any power wiring, screened if necessary, and the signal cabling to the panel should be screened and segregated from other cables carrying mains voltages or motor currents, and in particular away from cables carrying supplies switched by contactors or inverter drives.

The current consumption of the unit is up to 0.3 amps at 5 volts. The maximum supply volt drop is 0.2 volts at that current. Thus a power supply should be located near the unit. The supply 0 volts is then grounded at the unit.

2. Hardware

2.1 Panel Layout

The panel consists of an 11-key keypad and a 6 digit LED display as shown below:

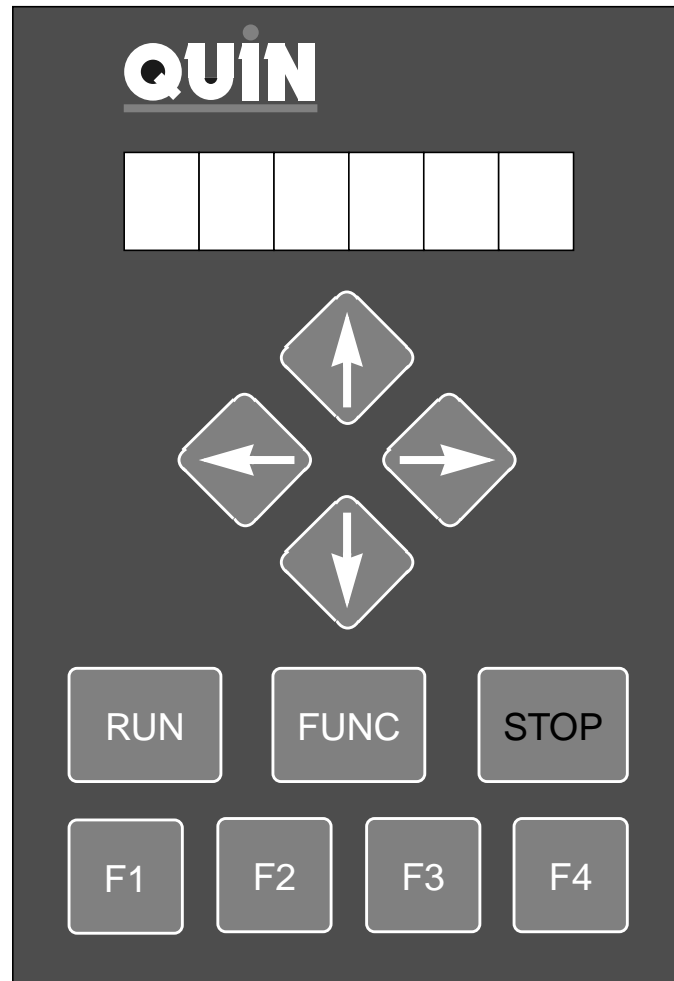


Figure 1. Mini Operator's Panel Layout.

The displays are 7 segment LED units with decimal point. They are capable of displaying the numbers 0 to 9 as well as a limited set of alphabetic characters.

The keys fall into the following groups:

- **Cursor keys**
Underneath the display there are 4 keys which are used to increment/decrement the value on display. The keys are also used for scrolling through the list of available fields.

- **Control keys**
The STOP and RUN keys are used to control the modes of operation of the panel. The FUNC key is used to select a field on the display.
- **Function Keys**
The four function keys can be programmed to initiate control sequences on the machine.

2.2 Serial Connection to PTS

The Mini Operator's panel is designed to be connected to Port B of a PTS and to a 5 volt power supply. Port B of the PTS should be configured for RS-485 point-to-point signals, as described in the PTS Installation Manual. The lead connecting the PTS to the panel should be wired as follows. Note that the supply 0 volts is earthed.

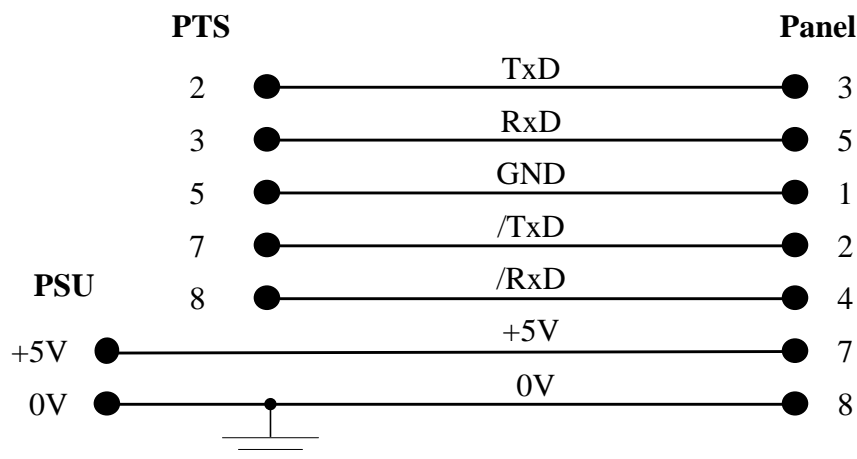


Figure 2. Serial Connection to PTS.

2.3 Software Key

The software for the Mini Operator's panel will not operate unless a software key has been entered to enable this option. Note that all options which use the second serial port are mutually exclusive. These options are the standard Operator's panel, Mini Operator's panel and the Modbus Interface program. To enable the software the following commands must be entered on Port A (the main programming port) in privileged mode. You enter the text in **bold** while the PTS displays something similar to the rest.

```
1> SK
Serial number: 006545
Feature      Version  Key
New feature? minipanel
Version? 0
OK
```

Note that it is necessary to turn the power off and back on again to run the Mini Operator's panel software.

2.4 Relevant Directives

The product is designed to be incorporated into a system for the control of machinery, and needs external equipment to enable it to fulfil this function. It must not be relied upon to provide safety-critical features such as guarding or emergency stop functions. It must not be put into service until the machinery into which it has been incorporated has been declared in conformity with the Machinery Directive 89/392/EEC and/or its relevant amendments.

The installation instructions in this manual should be followed in constructing a system which meets requirements.

The product has been tested in typical configurations and meets the EMC Directive 89/336/EEC, when fed from power supplies which meet 89/336/EEC and 92/31/EEC. The product uses only low voltages, and is therefore exempt under 73/23/EEC as amended by 93/68/EEC.

The product as normally supplied has low voltages accessible to touch, and must be mounted within a suitable cabinet to meet any required IP rating to BS EN 60529.

3. Mini Operator's Panel Functions

3.1 Modes of Operation

The Mini Operator's Panel has 3 main modes of operation as follows:

- **Run Mode**
This mode is mainly used by the machine operator when the machine is making product. The display shows a selection of machine operating parameters such as Speed, Bag length, etc., and the operator can use the increment/decrement keys to alter the parameters within preset limits. The main purpose of this mode of operation is to allow the operator to adjust the machine while it is running but only within strictly defined limits.
- **Setup Mode**
This mode is used to set the machine up for a new product or batch and allows the machine setter to do such things as selecting a profile or map and optionally to alter default parameters associated with it.
- **Configuration Mode**
Configuration mode is entered using the OP command on the main serial port of the PTS and is normally used by the engineer building the machine to configure the panel for his application. The engineer can define which parameters are displayed in Run mode along with their limits, and can define which parameters are to be changed in Setup mode.

3.2 Messages and Function Keys

There are three additional facilities which are available in both Run mode and Setup mode. These are as follows.

- **Error Variable**
The error variable can be configured to display a numeric value when the variable is written to.
- **Messages**
The panel can be configured to display status or warning messages which will override the data currently on display.
- **Function Keys**
The function keys at the bottom of the panel can be configured to initiate control sequences on the machine. Each key can be configured to work in Run mode, Setup mode or both.

4. Machine Control and Variables

The purpose of the Mini Operator's panel is to allow the operator and/or setter to control the machine and to display information on the machine's status or performance. In order to achieve this the Mini Operator's panel has to communicate with other tasks in the system, such as the motion control task, and it does so by using variables.

When specifying variable names during configuration of the panel, make sure you keep to the following rules:

- Names can consist of up to 3 alphanumeric characters
- The name must not include punctuation characters such as _(underscore) .(full stop) or any spaces.
- Upper and lower case letters are equivalent. For example *POS* and *pos* are the same variable.

4.1 Variables as Command Parameters

The simplest way to use a variable is as a command parameter. This can be done in most places where you would normally enter a number. For example to set the velocity on channel 1 you would normally enter the following command.

```
1> SV5000
1> SV
5000
?
1>
```

The following example shows how you can use a variable value instead of a fixed number. Note that the variable is prefixed with a \$ to distinguish it from a command mnemonic.

```
1> $SPD=7500
1> SV$SPD
1> SV
7500
?
1>
```

Although in the above example \$SPD was explicitly set before issuing the SV command, it could be set by an Increment field on the Mini Operator's panel for example.

You can also use variables combined with the usual operators +, -, * and / in an expression as in the following example. Note that the expression must be enclosed in brackets.

```
1> SV( ($SPD+500)/10 )
1> SV
800
?
1>
```

4.2 Using Variables to Trigger Commands

You can also use a variable to trigger a string of commands each time it is updated. This means that by updating a variable on the Mini Operator's panel you can trigger a string of motor commands. In the following example the command string CH1/SV\$SPD is triggered by the variable \$SPD so that each time \$SPD is updated (it need not change value) another SV command is executed.

```
1> $SPD>CH1/SV$SPD/SV
1> $SPD=2000
1 SV2000
1> $SPD=3000
1 SV3000
```

Once again the \$SPD variable could be changed using an increment field on the Mini Operator's panel so that each time the operator adjusts the field value the velocity updated to match it.

4.3 Variables with Query Commands

A query command is used to find the current value of a parameter. For example to display the current actual position of channel 1 you would type.

```
1> DP
1000
```

The position (1000) is displayed underneath the command. You can use this feature to set the value of a variable as follows.

```
1> $POS=DP
1> LV$POS
$POS=1000
```

In this example the DP query command placed the position into the \$POS variable and the LV command was used to display the value of \$POS. This technique can be used with a trigger variable to have a regularly updating display field on the operator's display page. For example, suppose the field has

```
Associated variable POS
Clock tick updates variable PS2
```

and the motor task has the following definition to put the demand position into POS when PS2 is updated

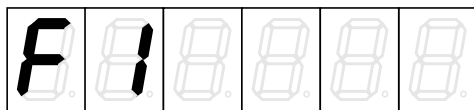
$$\$/PS2 > CH1 / \$POS = DD$$

then the field will show the current demand position every second.

5. Run Mode

In Run mode the operator can select one of a number of fields which represent a machine operating parameter to adjust or monitor. The panel enters Run mode when the RUN key is pressed. The panel can be configured to set a variable to a specified value at this time, so that some action, such as starting the machine, can be triggered. If the variable is set to the specified value from the PTS program this will force the panel into RUN mode. In this case the variable is not written to a second time.

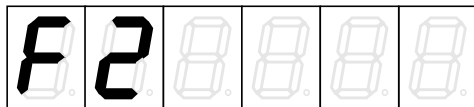
Initially the display shows the field title (F1, F2, F3, etc.) and the operator can scroll through the available fields to find the one he wants. Once the field has been located, pressing the FUNC key will display the parameter associated with the field. The parameter is displayed as a floating point number (to a preset precision) in engineering units. The display has the following general appearance.



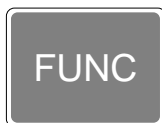
Initial display showing field title F1



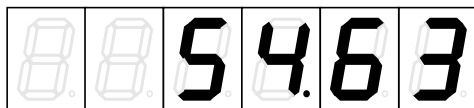
Press increment key to display next field title



Display shows required field title F2



Press FUNC key to display parameter value



Parameter value for field F2 is now displayed

Figure 3. Selecting a field in Run mode.

There are two different types of field available on the Run mode display. With an Increment field the increment/decrement keys can be used to add or subtract a pre-defined increment to the displayed parameter. Each time the parameter is changed the new value is automatically sent to the motor control task.

The other type of field is the Display field which is used to monitor the value of a machine parameter such as axis position or reference error for example. The parameter is used to update a variable which in turn updates the display when the parameter changes.

To select a different field, press the FUNC key to return to the field title display and then use the increment/decrement keys to locate the required field.

5.1 Increment field

An Increment field is used where the operator needs to adjust some operating parameter while the machine is running. The keys below the display are used to increment or decrement the parameter by a fixed amount each time the key is pressed. The value displayed is normally in engineering units such as R.P.M. or mm. and normally needs scaling to machine units before it is used. Finally the parameter has to be mapped to a control variable on the machine so that changing the display results in an effect on the machine. This is done by specifying a variable which is updated each time the operator changes the display.

An Increment field has a number of attributes as described below, which are specified when the panel is configured.

Title

This is the field title (F1, F2, etc.). This can be set to any combination of upper case letters, spaces and digits up to 6 characters long. Note that due to the limitations of the 7 segment displays, not all letters are immediately recognizable and should therefore be used with care.

Precision

Number of decimal places to be displayed.

Scale Factor and Offset

The scale factor and offset are used to convert the displayed value to machine units before updating the associated variable.

Upper and Lower Limits

These limits are applied to the displayed parameter to prevent the operator adjusting it too far.

Increment

Increment (decrement) to be applied each time the appropriate key is pressed. Note that the increment will only have an effect if the associated variable is defined and the increment multiplied by the scale factor actually changes the associated variable by 1 or more.

Associated Variable

The variable to be updated when the displayed parameter is changed. The value of the variable is computed as follows:

$$\text{variable} = \text{display} * \text{scale} + \text{offset}$$

Where display is the displayed parameter and scale and offset are as described above.

Associated variable is initialized on startup

This option can be set to 1 (true) or 0 (false) to control whether the value of the field is output to the associated variable on power-up.

Limit Variable

The limit variable can be defined to provide a set point for the value of the displayed parameter. If the limit variable is defined then the upper and lower limits are relative to it. The range of the displayed value is as follows:

```
set_pt = (limit_variable - offset) / scale
set_pt + low_limit <= display
display <= set_pt + high_limit
```

Note that the limit variable is descaled before being used as the set point.

Limits are percentage of limit variable

This option can be set to 1 (true) or 0 (false) to control whether the upper and lower limits are treated as percentages or not. This option only applies if the limit variable is defined. If the option is set to 0 (false) the limits are calculated as above. If the option is set to 1 (true) the set point is calculated as above but the limits are calculated as follows:

```
set_pt * (1 + low_limit / 100) <= display
display <= set_pt * (1 + high_limit / 100)
```

Clock tick updates variable

This option can be used to define a variable to be updated regularly once per second while the field is on display. The value of the variable is not changed but the fact that it is updated can be used to trigger a sequence of commands in the motor task which update the field's associated variable. For example, suppose the field has

```
Associated variable POS
Clock tick updates variable PS2
```

and the motor task has the following definition to put the demand position into POS when PS2 is updated

```
$PS2>CH1/$POS=DD
```

then the field will show the current demand position every second. This feature is not usually used on an Increment field but is very useful on a Display field (see below).

Auto Repeat

If this option is enabled (set to 1) the increment/decrement keys will automatically repeat approximately 5 times a second if they are held down. To avoid being over sensitive the keys will not start repeating until they have been held down for approximately one second.

5.2 Display Field

A display field is used to display the value of a machine parameter and update it when it changes. This is done by attaching the field to a database variable. Since the variable is in machine units it needs to be scaled prior to display. The attributes of a Display are much the same as the Increment field except that the limits, limit variable, percentage limits, increment and auto repeat are not used.

6. Setup Mode

Setup mode is used to change the machine's parameters ready for a new type or size of product etc. and would typically be used by the machine setter rather than the operator. The panel enters Setup mode when the STOP key is pressed or on initial power on. The panel can be configured to set a variable to a specified value at this time, so that some action, such as stopping the machine, can be triggered. If the variable is set to the specified value from the PTS program this will force the panel into STOP mode. In this case the variable is not written to a second time.

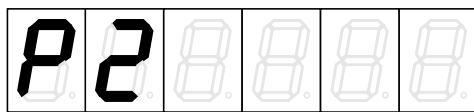
In SETUP mode the user can select from a list of fields which may be of the following types.

- Numeric field.
 This allows machine parameters to be changed.
- Save option.
 This option allows the current parameters to be saved in nonvolatile memory.
- Password field.
 This field allows access to the rest of the setup list to be controlled.

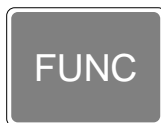
The procedure used to select a field in SETUP mode is similar to that used in RUN mode. Initially the display shows the field titles (P1, P2, P3, etc.) and the user scrolls through the fields using the increment/decrement keys. When the required field has been located the FUNC key is used to select the field.

6.1 Numeric Field

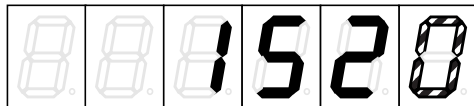
A Numeric field is used to change a particular machine parameter such as a map number or possibly a speed set point, when changing the machine setup for a new product. To allow more flexibility in setting parameter values, the procedure is different to that used for an Increment field. The increment/decrement keys add or subtract a value of 1 to the digit selected by the left/right cursor keys. This allows a new value to be entered much more quickly than by applying a fixed increment repeatedly. To provide some protection against entering unwanted values, the value of the parameter is not updated until the FUNC key is pressed. At this point the value of the parameter is checked against the low and high limits. If the value is outside the limits, the display shows the error message "FAIL" and the parameter is not updated. The user must press the FUNC key again to display the parameter and change it to an acceptable value. The following example demonstrates the operation of a numeric field.



Initial display showing field title P2



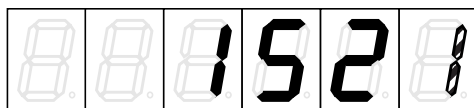
Press FUNC key to display parameter value



Parameter value for field P2 is displayed with the zero flashing.



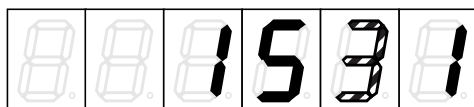
Press increment key to increment flashing digit by 1



New parameter value is displayed



Press left cursor followed by increment key to increment next digit to the left



The flashing digit moves to the left and the new parameter value is displayed

Figure 4. Numeric Field Operation

As with parameters in Run mode the data will be presented to the user in engineering units which means that generally the value will have to be scaled to convert it to machine units. The scaled value is used to update a database variable which in turn can be used to control some aspect of the machine. Data values will also be confined within absolute upper and lower limits. The following information is specified for each field when the panel is configured.

Title

This is the field title. This can be set to any combination of upper case letters, spaces and digits up to 6 characters long. Note that due to the limitations of the 7 segment displays, not all letters are immediately recognizable and should therefore be used with care.

Precision

Number of decimal places to be displayed.

Scale and Offset

Scale factor and offset to convert the displayed value to machine units.

Upper and Lower Limits

These limits will be applied to the displayed parameter to prevent the operator adjusting it too far.

Associated Variable

The variable to be updated when the displayed parameter is changed. The value of the variable will be as computed as follows:

$$\text{variable} = \text{display} * \text{scale} + \text{offset}$$

Where `display` is the displayed parameter and `scale` and `offset` are as described above.

Associated variable is initialized on startup

This option can be set to 1 (true) or 0 (false) to control whether the value of the field is output to the associated variable on power-up.

Limit Variable

The limit variable can be defined to provide a set point for the value of the displayed parameter. If the limit variable is defined then the upper and lower limits are relative to it. The range of the displayed value is as follows:

$$\begin{aligned} \text{set_pt} &= (\text{limit_variable} - \text{offset}) / \text{scale} \\ \text{set_pt} + \text{low_limit} &\leq \text{display} \\ \text{display} &\leq \text{set_pt} + \text{high_limit} \end{aligned}$$

Note that the limit variable is descaled before being used as the set point.

Limits are percentage of limit variable

This option can be set to 1 (true) or 0 (false) to control whether the upper and lower limits are treated as percentages or not. This option only applies if the limit variable is defined. If the option is set to 0 (false) the limits are calculated as above. If the option is set to 1 (true) the set point is calculated as above but the limits are calculated as follows:

$$\begin{aligned} \text{set_pt} * (1 + \text{low_limit} / 100) &\leq \text{display} \\ \text{display} &\leq \text{set_pt} * (1 + \text{high_limit} / 100) \end{aligned}$$
6.2 Save Option

The Save option allows the operator to save values which have been entered into fields in SETUP mode and/or RUN mode. By using the Save option, you can set the machine up for a new product and then save the setup so that system remembers the new product when it is switched off. Because saving is not automatic, you can safely alter parameters to experiment with new settings without losing the original set-up. You should only select the Save option when you are satisfied that the new settings are correct.

The Save option is selected by locating the relevant field title using the increment/decrement keys. To save parameters, you must select the option by pressing the FUNC key. The parameters to be saved may be either the Increment fields in Run mode or the Numeric fields in Setup mode or both. This is specified during configuration of the panel. While the parameters are being saved the following message is displayed:

....

followed by:

PASS

or

FAIL

To indicate whether the save was successful or not. Pressing the FUNC key again causes the field title to be displayed. Note that fields which have been saved will not be restored on startup unless the Startup write option has been set to 1 on the relevant fields.

The following attributes are specified for the Save option during configuration of the panel.

Text

This is the field title. This can be set to any combination of upper case letters, spaces and digits up to 6 characters long. Note that due to the limitations of the 7 segment displays, not all letters are immediately recognizable and should therefore be used with care.

Save Run mode values

If this attribute is set to 1, then the values of the Increment fields in Run mode will be saved when the Save option is selected. If this attribute is set to zero, the Run mode values will not be saved.

Save Setup mode values

If this attribute is set to 1, then the values of the Numeric fields in Setup mode will be saved when the Save option is selected. If this attribute is set to zero, the Setup mode values will not be saved.

6.3 Password

The password field allows access to the setup parameters to be controlled. One or more password fields can be placed anywhere in the setup list. When the operator selects a password field using the FUNC key he must then enter the correct password value using the arrow keys as for a numeric field. If the correct password is not entered the panel displays the word FAIL briefly and it is not then possible to scroll further up the list. If the correct password is entered the access to the remainder of the list is allowed as normal.

There are two parameters to configure for a password field.

Title

This is the field title. This can be set to any combination of upper case letters, spaces and digits up to 6 characters long. Note that due to the limitations of the 7 segment displays, not all letters are immediately recognizable and should therefore be used with care.

Password

An integer value up to 6 digits long.

7. Error Variable

The Mini Operator's panel can be used to display numeric error messages. The panel monitors a specified variable and displays an error message when the variable is updated to a non-zero value. The message is of the form

En

where n is the value of the variable. To return to the normal display it is necessary to clear the message by pressing the FUNC key. If the variable changes while the message is still on display then the next message is queued and will be displayed when the FUNC key is pressed again. If the panel is in Run mode when the message appears, pressing the STOP key will cause the panel to go to Setup mode and the variable associated with the STOP key (if any) will be updated. The message will continue to be displayed, however, until the FUNC key is pressed.

Configuring this feature requires the variable to be specified.

Associated Variable

The variable to monitor for update.

8. Message List

The Mini Operator's panel can be used to display error messages and warnings. The panel monitors a specified database variable and prints a preprogrammed message when the variable is written to. The message overwrites whatever is currently on the display and is cleared by pressing any key. The message list is generally configured to contain several different messages. The value that the variable is set to decides which message is displayed.

The following items have to be specified for the message list.

Associated Variable

The database variable to monitor for changes.

Message Text

The message text which appears on the display. This can be set to any combination of upper case letters, spaces and digits up to 6 characters long. Note that due to the limitations of the 7 segment displays, not all letters are immediately recognizable and should therefore be used with care.

Variable value

The variable value which triggers the message. If the variable is set to a value for which there is no corresponding message, nothing is displayed.

9. Function Keys

The Mini Operator's panel has 4 function keys along the bottom of the panel. Each key can be configured to initiate a control sequence on the machine at any time.

Each function key can be configured so that when it is pressed a variable is updated. This can be used to trigger a control sequence on the machine. The key can also update a variable when it is released. This allows the function keys to be programmed to do jog type actions where the machine moves while a key is pressed and stops when the key is released.

Function keys can be used in both Run mode and Setup mode or they can be configured to only operate in one mode. Function keys will not operate during configuration or while parameters are being saved using the Save option in Setup mode.

Function keys can be configured as follows.

Associated variable when key is pressed

This variable is updated when the key is pressed. It can be used to trigger a control sequence by defining it as a trigger variable using the > command.

Key press variable's value

The value the above variable is set to when the key is pressed.

Associated variable when key is released

This variable is updated when the key is released. This variable can also be used to trigger a control sequence. For example to implement a jog function you could configure function key F1 to update variable `$GO` when pressed and variable `$STP` when released. The following motor commands would then make channel 1 move at constant speed while F1 is held down.

```
$GO>CH1/SV5000/VC+  
$STP>CH1/ST
```

Key release variable's value

The value the above variable is set to when the key is released.

Operational in Run mode

If this option is set to 1 the key works in Run mode. If it is set to zero the key does not work in Run mode.

Operational in Setup mode

If this option is set to 1 the key works in Setup mode. If it is set to zero the key does not work in Setup mode.

10. Configuration Mode

The Mini Operator's Panel can be configured either directly using the OP command or by using the Operator's Panel Editor which is a PC Windows program delivered with the PTS Toolkit V1.3.1 or higher. The remainder of this chapter describes the direct method of configuration using the OP command.

Configuration mode can only be accessed using the OP command on the main serial port. When OP is entered the following message will be displayed. Note that normal motor command processing is suspended while you are configuring the panel.

Operator's Panel Configuration

Whilst in this mode the system will not execute any motor commands

After configuring the Panel press the ~ key to return to motor control

Press a key to continue

If the panel is not in the correct state when you attempt to enter configuration, the following message will be displayed.

Cannot enter configuration mode at this time

In order to enter configuration, you must return to Setup mode and ensure that a field title is on the display.

Once in Configuration mode the user has access to all the information which defines the contents of the Run mode display, the structure and contents of the Setup mode display, the Error variable, the Message List and the Function keys. He is able to change any aspect of the two displays including adding or deleting fields, etc.

Configuration is menu driven using a simple menu implementation which makes no assumptions about the type of terminal being used. In particular, cursor keys are not used so that making a selection from a menu is done by entering the number corresponding to your choice. When the panel has been configured, the user has the option of saving the new configuration, or he may prefer to test the new configuration first and save it later.

Safety Note

The configuration process changes the values of defined variables. You should ensure that this can not cause any dangerous operations by physically disabling motor drives and actuators.

10.1 Main Menu

The Main menu provides access to the main configuration options and appears as follows.

```
Mini Operator's Panel Configuration. Version 1.7 Date 02/11/98
Do you want to

1) Configure Run mode display
2) Configure Setup mode display
3) Configure Error Variable
4) Configure Message List
5) Configure Function Keys
6) Save configuration to NVM
7) Read configuration from NVM
8) Upload configuration to PC
9) Download configuration from PC
10) Configure Run Button
11) Configure Stop Button

Please enter selection or 0 to cancel :
```

10.2 Run Mode Display Configuration

To configure the Run mode display, select option 1 (Configure Run mode display) when a menu of the currently available fields will be displayed as in the following example.

```
Run Mode List - available lines

1) F1
2) F2
3) F3

Please enter line number or 0 to exit :
```

When a field is selected it is possible to change the attributes of the field, to add a new field following the one selected, or to delete it, as shown below.:

Do you want to

- 1) Change item attributes
- 2) Add a new item before this one
- 3) Add a new item after this one
- 4) Delete the item

Please enter choice or 0 to cancel :

The selected field can be deleted by selecting option 4 (Delete) above. To change the field's attributes or simply to view them, select option 1 (Change) from the above menu. Note that the type of field (Increment or Display) can not be changed once the field has been added to the display. To change the type of a field, it is necessary to delete the current field and replace it with a new one of the correct type.

To add a new field to the Operator's display, select a field next to the one you want to add, and select option 2 (Add before) or option 3 (Add after) from the menu above. The following field type menu will be displayed so that you can select what type of field to add.

Line Type menu

- 1) Increment Field
- 2) Display Field

Please enter choice or 0 to cancel :

Once a type has been selected, the appropriate attribute menu will be displayed. This can be filled in to create the new field as required. Be sure to fill in the associated variable and increment if applicable, otherwise the field will not work properly.

It is important to note that the field titles are always maintained in numerical order as they appear in the list. This means that adding a new field in the middle of a list will change the field titles of all the fields following it.

10.2.1 Configuring Fields

The attribute menu for an Increment field such as field 1 would be as follows

Increment Field attribute menu

- 1) Title F1
- 2) Precision 1
- 3) Scale factor 10.000000
- 4) Offset 0.000000
- 5) Lower limit 0.000000
- 6) Upper limit 100.000000
- 7) Increment 1.000000
- 8) Associated Variable SPD
- 9) Associated variable is initialized on startup 0
- 10) Limit Variable
- 11) Limits are percentage of limit variable 0
- 12) Clock tick updates variable
- 13) Auto repeat 1

Please select attribute or 0 to exit :

Any attribute can be changed by selecting the appropriate attribute number (followed by <Return>) and entering a new value for the attribute after the prompt. The menu should then be redisplayed with the new attribute value. If there is something wrong with the attribute value, for example a precision greater than 10, the attribute will not be updated and instead another prompt will be issued.

The attribute menu for a Display field is as follows:

Display Field attribute menu

- 1) Title F2
- 2) Precision 0
- 3) Scale factor 1.000000
- 4) Offset 0.000000
- 5) Associated Variable POS
- 6) Clock tick updates variable

Please select attribute or 0 to exit :

Once the attributes for a field have been updated you can return to the menu of available fields by entering zero or simply <Return> on its own.

10.3 Setup Mode Configuration

To configure the Setup mode display select option 2 (Configure Setup mode display) from the main menu, when a list of available fields similar to the following will be displayed.

Setup Mode List - available lines

- 1) P1
- 2) P2
- 3) P3

Please enter line number or 0 to exit :

By selecting an item from the list, you have the options of changing the item's attributes, adding a new item (either before or after the selected one), or deleting the item. When an item is selected the following menu is displayed.

Do you want to

- 1) Change item attributes
- 2) Add a new item before this one
- 3) Add a new item after this one
- 4) Delete the item

Please enter choice or 0 to cancel :

When adding an item to the list, the Line type menu allows you to specify whether the new item should be a Numeric field, Save option or Password field.

Line Type menu

- 1) Numeric Field
- 2) Save option
- 3) Password Field

Please enter choice or 0 to cancel :

10.3.1 Configuring Numeric Fields

An example menu for a Numeric field is shown below.

```
Numeric Field Attribute menu
Do you want to change

1) Title P2
2) Precision 0
3) Scale factor 1.000000
4) Offset 0.000000
5) Lower limit 0.000000
6) Upper limit 0.000000
7) Associated Variable LEN
8) Associated variable is initialized on startup 0
9) Limit Variable
10) Limits are percentage of limit variable 0

Please select attribute or 0 to exit :
```

The attributes can be changed by selecting the attribute number and entering a new value in response to the prompt.

10.3.2 Configuring the Save Option

If the item to be added or changed is the Save option, the attributes menu will be similar to the following.

```
Save Option Attribute menu
Do you want to change

1) Title P4
2) Save Run mode values 1
3) Save Setup mode values 1

Please enter choice or 0 to cancel :
```

This shows a Save option configured to save the Setup mode parameters only. Note that you are not allowed to set options 3 and 4 both to zero. Remember that to restore the saved values on power-up, you will have to set the Startup write option to 1 on the relevant fields.

10.3.3 Configuring a Password

The menu for configuring a password is similar to the one below.

```
Password Attribute menu
Do you want to change

1) Title PASS
2) Password 1234

Please enter choice or 0 to cancel :
```

This menu allows the title and the password to be changed by selecting the relevant choice (1 or 2) and entering the new value as required.

10.4 Configuring the Error Variable

The Error variable which controls the display of messages can be configured by choosing option 3 (Error Variable) from the main menu. This will cause the following menu to be displayed.

```
Error Variable Attributes
Do you want to change

1) Associated Variable ERR

Please enter choice or 0 to cancel :
```

This menu allows you to change the variable which controls the display of messages, or to turn it off altogether by entering a null variable (<Return> only).

10.5 Configuring the Message List

The Message List can be configured by choosing option 4 from the main menu. This will cause the Message List menu to be displayed as follows.

```
Message List Attribute menu
Do you want to change

1) Associated Variable MSG
2) Message list

Please enter choice or 0 to cancel :
```

This menu allows the message list variable to be changed by selecting choice 1. Selecting choice 2 allows the list of messages to be viewed or changed and displays a menu similar to the following.

Message List

- 1) BUSY
- 2) INIT

Please enter message number or 0 to exit :

Selecting a message on the list allows a new message to be added or for the existing message to be changed or deleted as shown in the following menu.

Do you want to

- 1) Add a new message
- 2) Change the message
- 3) Delete the message

Please enter choice or 0 to cancel :

Choosing options 1 or 2 to add or change a message causes the message attribute menu to be displayed as follows.

Message Attribute menu

Do you want to change

- 1) Text
- 2) Variable's Value 0

Please enter choice or 0 to cancel :

Choosing option 1 from this menu allows the message text to be displayed. Choosing option 2 allows you to set the value of the variable which causes the message to be displayed.

10.6 Configuring Function Keys

When option 5 (Configure Function Keys) is chosen from the main menu the function key menu will be displayed similar to the following example.

Function Key menu

- 1) F1
- 2) F2
- 3) ** BLANK **
- 4) ** BLANK **

Please enter function key number or 0 to exit :

This menu shows function keys F1 and F2 defined with all the rest undefined. To change or delete an existing function key enter the function key number when the change menu will be displayed as follows.

Do you want to

- 1) Change function key attributes
- 2) Delete function key

Please enter choice or 0 to cancel :

To change the function key attributes enter 1 (Change function key attributes). The attribute menu is then displayed. To delete the function key definition enter 2 (Delete function key). If an undefined key is selected or a key is to be changed, a function key attribute menu similar to the following is displayed.

Function Key attribute menu

- 1) Associated variable when key is pressed INT
- 2) Key press variable's value 1
- 3) Associated variable when key is released
- 4) Key release variable's value 1
- 5) Operational in Run mode 1
- 6) Operational in Setup mode 1

Please enter choice or 0 to cancel :

This menu shows a function key which will update the variable *\$INT* when it is pressed, will not update a variable when it is released, and works in both Run and Setup modes. Note that at least one variable must be defined or the key will not do anything.

10.7 Saving the Configuration

Selecting option 6 (Save configuration to NVM) on the main menu causes the current configuration to be saved to nonvolatile memory. This configuration is automatically used in future when the system is powered up. The configuration consists of all the settings for the Run mode and Setup mode displays, the Message lists, Function keys and the current value of each field. This makes it possible to ensure that the panel powers up with appropriate default values. Note that the associated database variables will not be set unless a field's Startup Write option has been configured as true.

10.8 Reading the Configuration

Selection of option 7 (Read configuration from NVM) on the main menu causes the current configuration to be cleared and replaced by the copy stored in nonvolatile memory. The configuration consists of all the settings for the Run mode and Setup mode displays, the Message lists and Function keys. The field values which are restored will either be those saved by the Setup Save option or the Save configuration whichever happened most recently.

10.9 Uploading the Configuration

In order to keep a backup of the configuration or to copy it to another machine, it is possible to send the configuration to an IBM PC computer or similar and save it on disk. The PC must have a serial port (COM1 or COM2) and you will have to run a communications program (such as PTS Toolkit) with the ability to capture data from the serial port and send data to the serial port. Note that this option uploads the current configuration on display rather than the configuration in nonvolatile memory.

To upload the configuration, first connect the PC to the main serial port of the PTS and run the communications program in transparent mode so that the PC acts as a terminal. Enter the OP command if necessary to bring up the main configuration menu. Now set the PC to capture to a suitable file and select option 8 (Upload) from the menu. The PTS will output the configuration in ASCII text which will be stored in the designated file. When the upload has finished a banner

```
***** End of configuration file *****
```

will appear on the screen. Terminate the capture and press ENTER to return to the main configuration menu.

Before changing the configuration, type out the file and verify that it contains the following lines.

```
8
***** Mini Panel Configuration. Version 1.7 *****
.
.
.
***** End of configuration file *****
```

The figure 8 at the beginning of the file is the menu option number and will not interfere with the download.

10.10 Downloading the Configuration

A configuration file which has been saved on the PC can be downloaded to the PTS to replace the existing configuration or to initialize a new machine. Note that the existing configuration will be lost, unless it has been previously uploaded or saved in NVM. To download a file to the PTS, connect the PC to the PTS and bring up the main configuration menu as for uploading. Select option 9 (Download) on the menu and instruct the communications program to send the appropriate file. Once the file has been downloaded, the PTS will detect the end of file and will re-display the main configuration menu.

Important Note

This option downloads to the current configuration on display and not to nonvolatile memory. This means that the configuration must be explicitly saved before turning off the power or the downloaded configuration will be lost.

The configuration files contain a checksum field which is used to verify that the file has not been corrupted during downloading or saving. If the checksum indicates that the file has been corrupted an error message will be displayed. Normally it is wise to retry the download. If the file has been deliberately modified, this will invalidate the checksum. In this case the error message can safely be ignored.

10.11 Configuring the Run Button

Selecting option 10 (Run Button) on the main configuration menu allows you to set up a variable which will be updated when the panel goes from Setup to Run mode. By setting up the variable to trigger a motor control sequence the Run button can be used to start the machine. The Run button configuration menu allows you to define the variable to be associated with the Run key and the value to be written to the variable when the button is pressed.

Run Button Attributes
Do you want to change

- 1) Associated Variable RUN
- 2) Variable's Value 1

Please enter choice or 0 to cancel :

10.12 **Configuring the Stop Button**

Selecting option 11 (Stop Button) on the main configuration menu allows you to set up a variable which will be updated when the panel goes from Run to Setup mode. By setting up the variable to trigger a motor control sequence the Stop button can be used to stop the machine. The Stop button configuration menu allows you to define the variable to be associated with the Stop key and the value to be written to the variable when the button is pressed.

Stop Button Attributes

Do you want to change

- 1) Associated Variable STP
- 2) Variable's Value 0

Please enter choice or 0 to cancel :

11. Error Messages

The following error messages can appear during configuration:

Can't save configuration due to insufficient space

There is not enough space on the EEPROM device for the parameters to be saved. It may be possible to reduce the size of the PTS parameter file and then try again.

Can't save configuration due to error n

Parameters can not be saved due to an operating system error. Please note the error number and contact your sales office. If parameters can not be saved due to an error or insufficient space you can avoid losing your new configuration by uploading it to a PC.

Can't download configuration due to insufficient space

The configuration can not be downloaded from the PC due to lack of space. It may be possible to reduce the size of the PTS parameter file and then try again.

Can't download configuration due to bad checksum

The configuration has been corrupted during the download from the PTS. Normally you should try the download again. This message will also be seen when downloading a file which has been deliberately modified as this will invalidate the checksum. In this case it is usually safe to ignore the message.

Can't download configuration due to error n

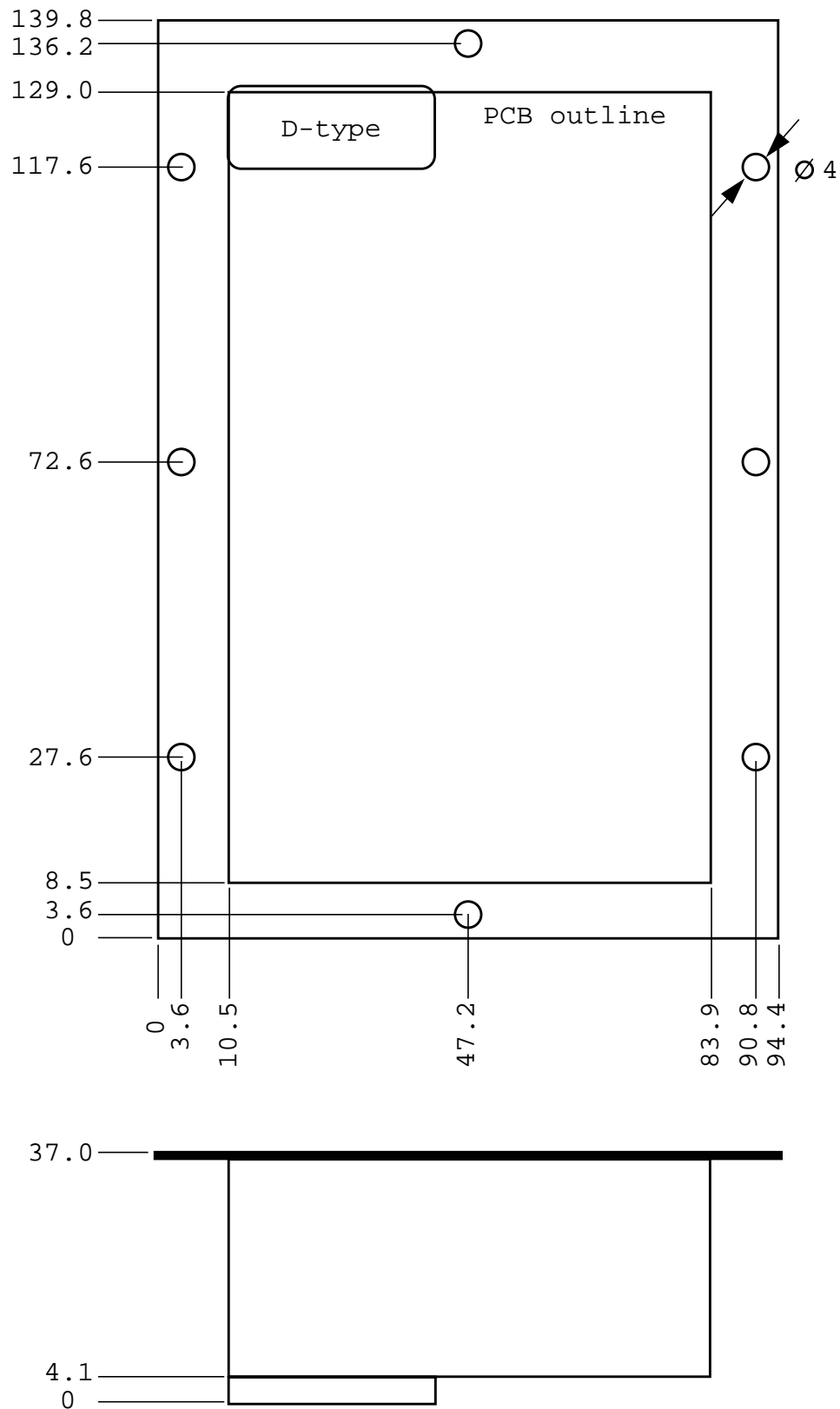
Parameters can not be downloaded due to an operating system error. Please note the error number and contact your sales office.

Cannot create new x due to lack of memory

Cannot create new x due to error n

These messages mean that a new item (x) cannot be added to the system due to a shortage of memory or some other operating system error.

12. Dimensions



All dimensions in mm.

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