

RP240

Remote Operator Panel Interface

INTRODUCTION

The ZETA6104 is directly compatible with the Compumotor RP240 Remote Operator Panel. This document describes how to use the ZETA6104 with the RP240. Instructions for connecting the RP240 to the ZETA6104 are provided in the *ZETA6104 Installation Guide*. Refer to the *Model RP240 User Guide* (p/n 88-012156-01) for information on RP240 hardware specifications, mounting guidelines, environmental considerations, and troubleshooting.

As shipped from the factory, the ZETA6104 is ready to operate the RP240 on the **COM 2** port (other serial port configuration options are available—see *Configuration*).

You may use the RP240's programmable features to make it a custom operator interface (see *Operator Interface Features* below), or you may use the RP240's default menu structure to run programs, jog the load, check status information, and reset the ZETA6104 (see *Using the Default Mode* below).

Configuration

To configure the ZETA6104's serial ports for use with the RP240 and/or 6000 language commands, use the DRPCHK command. Be sure to select the affected serial port (**COM 1** or **COM 2**) with the PORT command before you execute the DRPCHK command. Once you issue the DRPCHK command, it is automatically saved in non-volatile memory. The configuration options are:

- DRPCHKØ.....Use the serial port for 6000 commands only (default for **COM 1**)
- DRPCHK1.....Check for RP240 on power up or reset. If detected, initialize RP240. If no RP240, use serial port for 6000 commands.
- DRPCHK2.....Check for RP240 every 5-6 seconds. If detected, initialize RP240. Do not use port for 6000 commands.
- DRPCHK3.....Check for RP240 on power up or reset. If detected, initialize RP240. If no RP240, use serial port for DWRITE command only. The DWRITE command can be used to transmit text strings to remote RS-232C devices. (default setting for **COM 2**)

Example **COM 2** is to be used for RS-485; **COM 1** is to be used for RP240, but the RP240 will be plugged in on an as-needed basis. The set-up commands for such an application should be executed in the following order:

```
PORT1          ;Select COM1 serial port for setup
DRPCHK2        ;Configure COM1 for RP240, periodic check
PORT2          ;Select COM2 serial port for setup
DRPCHKØ        ;Configure COM2 for 6000 commands only
```

Operator Interface Features

The RP240 may be used as the ZETA6104's *operator interface*, not a program entry terminal. As an operator interface, the RP240 offers the following features:

- Displays text and variables
- 8 LEDs can be used as programmable status lights
- Operator data entry of variables: read data from RP240 into variables and command value substitutions (see table in Appendix C of *6000 Series Software Reference Guide*)

Typically the user creates a program in the ZETA6104 to control the RP240 display and RP240 LEDs. The program can read data and make variable assignments via the RP240's keypad and function keys.

The 6000 Series software commands for the RP240 are listed below. Detailed descriptions are provided in the *6000 Series Software Reference Guide*. The example below demonstrates the majority of the 6000 Series commands for the RP240.

```

DCLEAR .....Clear The RP240 Display
DJOG.....Enter RP240 Jog Mode
DLED..... Turn RP240 LEDs On/Off
DPASS .....Change RP240 Password
DPCUR ..... Position The Cursor On The RP240 Display
[DREAD] .....Read RP240 Data
[DREADF] ..... Read RP240 Function Key
DREADI .....RP240 Data Read Immediate Mode
DRPCHK .....Check for RP240
DVAR.....Display Variable On RP240
DWRITE ..... Display Text On The RP240 Display

```

Programming Example

Command	Description
> DEF panel1	Define program panel1
- REPEAT	Start of repeat loop
- DCLEARØ	Clear display
- DWRITE"SELECT A FUNCTION KEY"	Display text "SELECT A FUNCTION KEY"
- DPCUR2,2	Move cursor to line 2 column 2
- DWRITE"DIST"	Display text "DIST"
- DPCUR2,9	Move cursor to line 2 column 9
- DWRITE"GO"	Display text "GO"
- DPCUR2,35	Move cursor to line 2 column 35
- DWRITE"EXIT"	Display text "EXIT"
- VAR1 = DREADF	Input a function key
- IF (VAR1=1)	If function key #1 hit
- GOSUB panel2	GOSUB program panel2
- ELSE	Else
- IF (VAR1=2)	If function key #2 hit
- DLED1	Turn on LED #1
- GO1	Start motion on axis #1
- DLEDØ	Turn off LED #1
- NIF	End of IF (VAR1=2)
- NIF	End of IF (VAR1=1)
- UNTIL (VAR1=6)	Repeat until VAR1=6 (function key 6)
- DCLEARØ	Clear display
- DWRITE"LAST FUNCTION KEY = F"	Display text "LAST FUNCTION KEY = F"
- DVAR1,1,Ø,Ø	Display variable 1
- END	End of panel1
>	
> DEF panel2	Define prog panel2
- DCLEARØ	Clear display
- DWRITE"ENTER DISTANCE"	Display text "ENTER DISTANCE"
- D(DREAD)	Enter distance number from RP240
- END	End of panel2

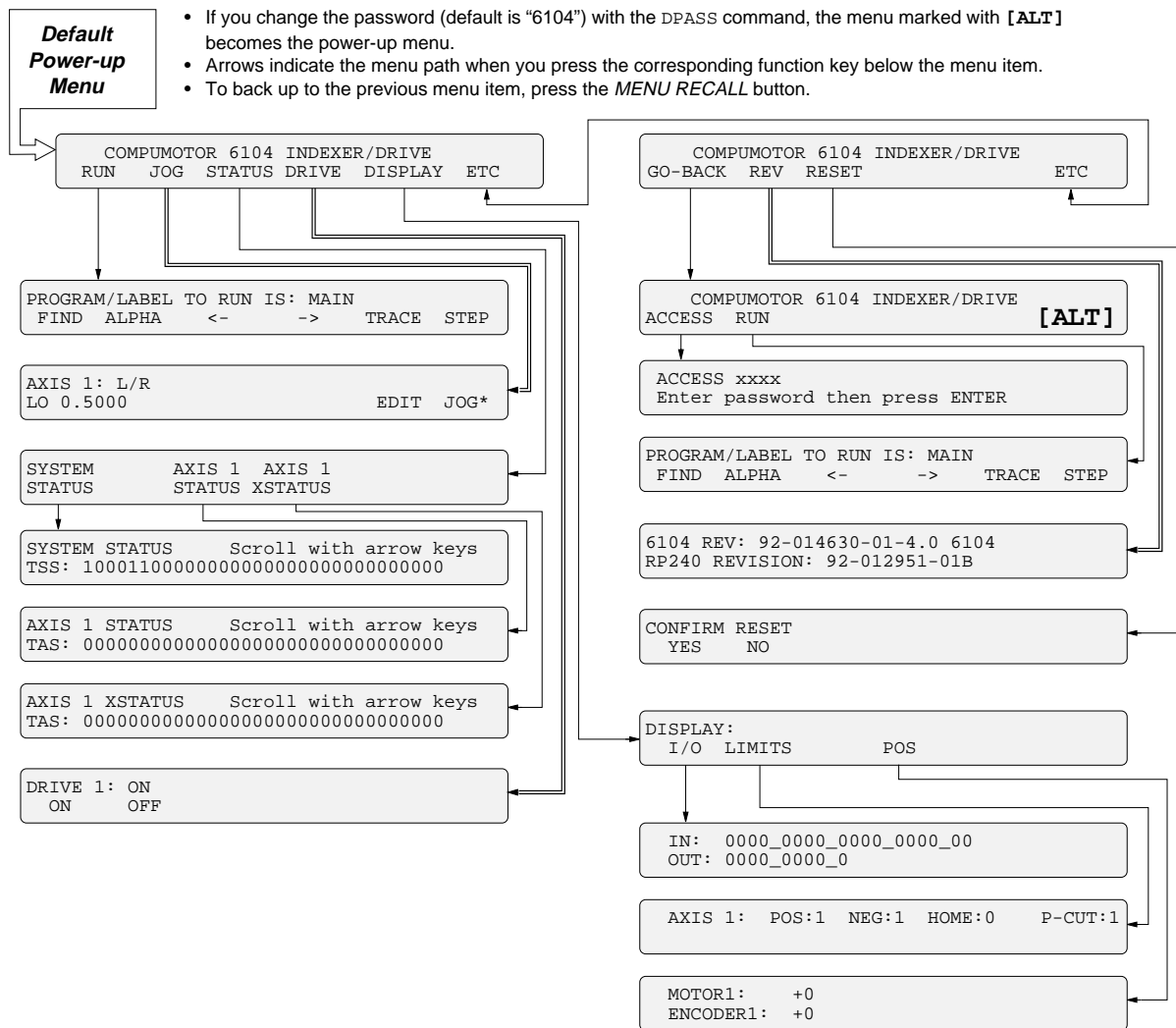
Using the Default Mode

On power-up, the ZETA6104 will automatically default to a mode in which it controls the RP240 with the menu-driven functions listed below.

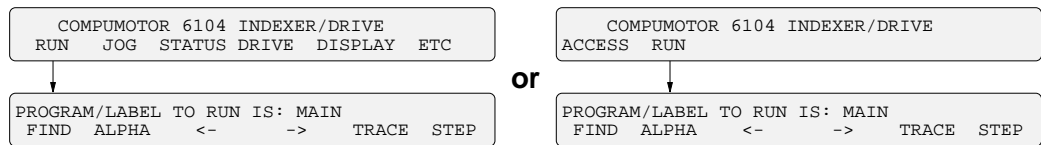
- Run a stored program (RUN, STOP, PAUSE and CONTINUE functions)
- Jog the load
- Display the status of:
 - System (TSS)
 - Axis (TAS)
 - Extended Axis (TASX)
 - I/O (TIN and TOUT)
 - Limits (TLIM) and P-CUT input (TINO bit #6)
 - Position: Motor (TPM) and Encoder (TPE)
 - Firmware revision levels for the ZETA6104 (TREV) and the RP240
- Enable or disable the internal drive (DRIVE)
- Access RP240 menu functions with a security password (set with DPASS)
- RESET the ZETA6104

The flow chart below illustrates the RP240's menu structure in the default operating mode (when no ZETA6104 user program is controlling the RP240). Press the **Menu Recall** key to back up to the previous screen. The menu functions are described in detail below.

NOTE: To disable these menus, the start-up program (the program assigned with the STARTP command) must contain the DCLEARØ command.



Running a Stored Program



After accessing the RUN menu, press **F1** to “find” the names of the programs stored in the ZETA6104’s memory; pressing **F1** repeatedly displays subsequent programs in the order in which they were stored in BBRAM. To execute the program, press the **ENTER** key.

To type in a program name at the location of the cursor, first select alpha or numeric characters with the **F2** function key (characters will be alpha if an asterisk appears to the right of ALPHA, or numeric if no asterisk appears). If alpha, press the up (2) or down (8) keys to move through the alphabet, if numeric, press the desired number key. Press **F3** to move the cursor to the left, or **F4** to move the cursor to the right.

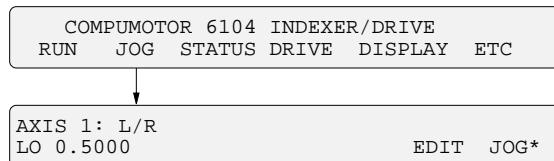
Only user programs defined with DEF and END may be executed from this menu. Contouring paths cannot be executed from this menu; they must be executed from the terminal emulator with the PRUN command, or you can place the PRUN (name of path) command in a user program and then execute that program from this menu.

When a program is RUN and TRACE is selected (TRACE*), the RP240 display will trace all program commands as they are executed. This is different from the TRACE command in that the trace output goes to the RP240 display, not to a terminal via the serial port.

HINT: If you wish to display each command as it is executed, select STEP and TRACE and press the ENTER key to step through the program.

When a program is RUN and STEP is selected, step mode has been entered. This is similar to the STEP command, but when selected from the RUN menu the step mode allows single stepping by pressing the **ENTER** key. Both RP240 trace mode and step mode are exited when program execution is terminated.

Jogging



You can jog the load by pressing the arrow keys on the RP240’s numeric keypad. Press an arrow key to start motion; release the arrow key to stop motion. The left and right arrow keys correspond to negative and positive direction, respectively.

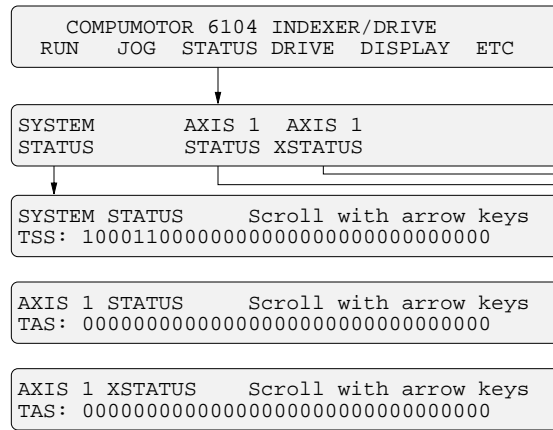
The HI and LO values in the jog menu represent the velocity in units of revs/sec (if scaling is enabled, the value is multiplied by the programmed SCLV value).

To edit the jog velocity values:

1. Press the **F5** function key under EDIT (edit mode indicated with an asterisk).
2. Press the **F1** function key to select the HI and LO values (cursor appears under the first digit of the value selected).
3. Using the numeric keyboard, enter the value desired.
4. Repeat steps 2 and 3 for all values to be changed.
5. Press **ENTER** when finished editing.
6. To jog with the new velocity values, first press the **F6** function key (under JOG) to enable the arrow keys again.

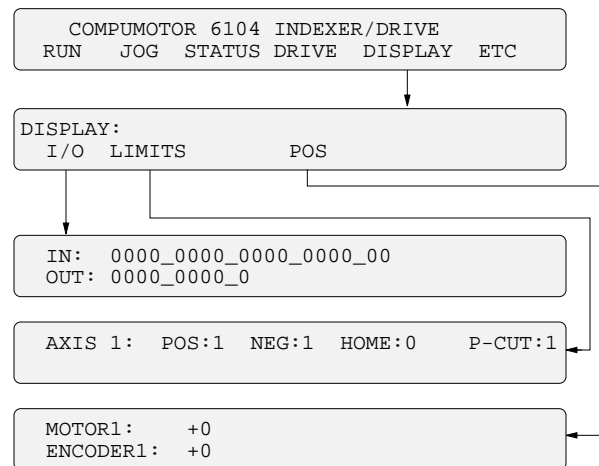
Jog acceleration and deceleration values are specified by JOGA and JOGAD commands, respectively.

Status Reports:
System & Axis



After accessing the desired status menu, you can ascertain the function and status of each system (TSS) or axis (TAS and TASX) status bit by pressing the arrow keys on the numeric keypad.

Status Reports:
I/O, Limits, Position



I/O Menu:

- Input bit pattern (left to right): Bits 1-16 are the general-purpose programmable inputs, bits 17 & 18 are triggers A and B (**TRG-A** and **TRG-B** on the **I/O** connector).
- Output bit pattern (left to right): Bits 1-8 are the general-purpose programmable outputs, bit 9 is auxiliary output A (**OUT-A** on the **I/O** connector).

LIMITS Menu:

- “POS” refers to the hardware end-of-travel limit imposed when counting in the positive direction. “NEG” refers to the limit imposed when counting in the negative direction.
- A “1” indicates that the input is grounded, “0” indicates not grounded.

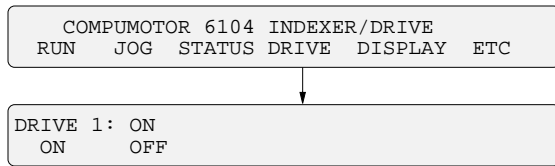
The end-of-travel limits (POS and NEG) must be grounded to allow motion (this is reversed if the active level is reversed with the LHLVL command).

The Pulse Cut input (**P-CUT** terminal on the **I/O** connector) must also be grounded before motion is allowed. When not grounded, step pulses are stopped independent of the ZETA6104’s microprocessor.

POS Menu:

- The position values shown are continually updated.
- Position values are subject to the SCLD scaling factor (if scaling is enabled—SCALE1), PSET offset value, encoder feedback polarity (ENCPOL), and commanded direction polarity (CMDDIR). The motor position will report zero if the encoder step mode is enabled (ENC1).

Enabling and Disabling the Drive

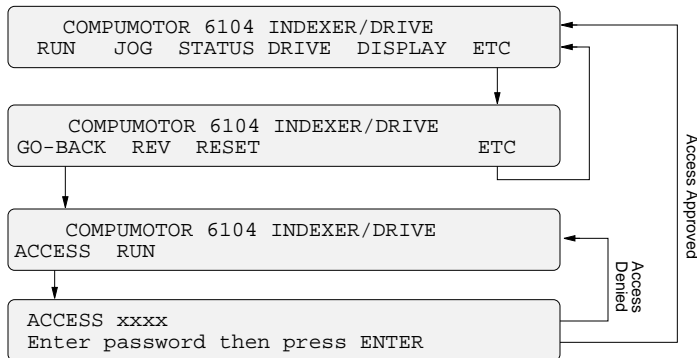


In the DRIVE menu, the current status of the internal drive is displayed. To enable or disable the internal drive, press **F1** or **F2**. This menu offers the same functionality as the DRIVE command.

WARNING

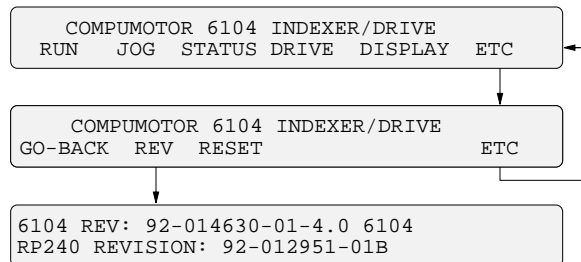
Shutting down a rotary drive system allows the load to freewheel if there is no brake installed.

Access Security

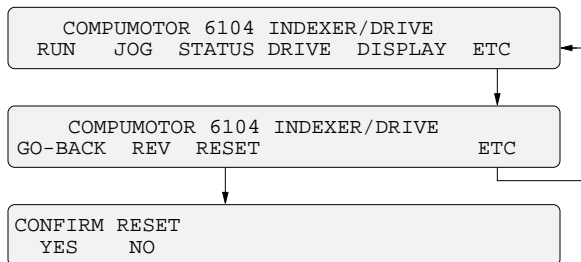


If the RP240 password is modified with the DPASS command to be other than DPASS6104 (the default password is “6104”) the access menu then becomes the new default menu after power-up or executing a RESET. After that, the new password must then be entered to access the original default menu (see Access Approved path in illustration above). If the operator does not know the new password, all he or she can do is run programs stored in the ZETA6104 (RUN).

Revision Levels



Resetting the ZETA6104



After accessing the RESET menu, press the **F1** key to execute a reset (or press **F2** to cancel and exit the menu). The reset is identical to issuing a RESET command or cycling power to the ZETA6104. If a start-up program has been assigned with the STARTP command, that program will be executed.

CAUTION

Executing a reset will restore all command values (those not saved in programs or variables) to their factory default setting.