About This Guide

This manual is intended as an operator’s reference guide to using RS3 consoles. It explains the purpose of operating displays, keyboard functions, and the correct operator response to alarms and system faults.

Section 1 Describes and illustrates the single CRT Multitube Command Console (MTCC) keyboard.

Section 2 Describes the major displays and display elements that are used to operate the RS3 control system. These include controller faceplates, graphic displays, and reports.

Section 3 Describes continuous control terminology and standard continuous operations and the console interface.

Section 4 Describes discrete control terminology and standard continuous operations and the console interface.

Section 5 Describes the use of trending displays.

Section 6 Describes RS3 alarm displays and operator responses to alarms.

Section 7 Describes the MTCC with the enhanced keyboard. Emphasis is on how operator procedures are performed with this MTCC keyboard option, especially using menus.

Appendix A Describes how to respond to system faults and how to recover from power failures.
Changes for This Release

Changes to this manual were made to incorporate:

- New alarm banner/message functionality
- Keyboard changes to reflect the single CRT MTCC configuration.

Revision Level for This Manual

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<th>For This Software Version:</th>
<th>Refer to This Document:</th>
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References to Other Manuals

References to other RS3 user manuals list the manual, chapter, and sometimes the section as shown below.

Example Entries:
For ..., see CC: 3. For ..., see CC: 1-1.

Manual Title Chapter Manual Title Chapter-Section

Abbreviations of Manual Titles
AL = Alarm Messages
BA = ABC Batch
CB = ControlBlock Configuration
CC = Console Configuration
DT = Disk and Tape Functions
IO = I/O Block Configuration
OP = Operator’s Guide
OV = System Overview and Glossary
PW = PeerWay Interfaces
RB = Rosemount Basic Language
RI = RNI Release Notes and Installation Guide
SP = Site Preparation and Installation
SV = Service
Reference Documents

Prerequisite Documents

You should be familiar with the information in the following documents before using this manual:

- System Overview Manual and Glossary 1984-2640-19x1
- Software Release Notes, Performance Series 1 1984-2819-01xx
- Software Loading and Upgrade Procedure, Including Batch 1984-2819-02x1

Related Documents

You may find the following documents helpful when using this manual:

- ABC Batch Quick Reference Guide 1984-2814-12xx
- ABC Batch Software Manual 1984-2654-19x1
- Alarm Messages Manual 1984-2657-19x1
- Configuration Quick Reference Guide 1984-2812-09xx
- Console Configuration Manual 1984-2643-19x1
- ControlBlock Configuration Manual 1984-2646-19x1
- Disk and Tape Functions Manual 1984-2644-19x1
- I/O Block Configuration Manual 1984-2645-19x1
- Operator’s Guide 1984-2647-19x1
- PeerWay Interfaces Manual 1984-2650-19x1
- RNI Programmer’s Reference Manual 1984-3356-02x1
- RNI Release Notes and Installation Guide 1984-3357-02x1
- Rosemount Basic Language Manual 1984-2653-19x1
- Service Manual, Volume 1 1984-2648-19x1
- Service Manual, Volume 2 1984-2648-19x2
- Site Preparation and Installation Manual 1984-2642-19x1
- Software Discrepancies for Performance Series 1 1984-2819-03xx
- User Manual Master Index 1984-2641-19x1
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Section 1:
MTCC Keyboards
The MTCC has three keyboards: the operator keyboard, the option keyboard, and the configuration keyboard. The operator and option keyboards are shown on page 1-3. The configuration keyboard (which is a standard QWERTY-type keyboard) is not required to operate the RS3. The MTCC keyboards are modular devices that plug into the console CRT. The illustrations on the following pages show the functions of the keys on the operator and option keyboards.
OPTION KEYBOARD

OPERATOR KEYBOARD

MTCC Keyboards
PEERWAY. Calls up Plant Status screen.

CONTROLFILE. Calls up Control File Status screen. Press key, type node number on status line, and press [ENTER].

CONTROLBLOCK. Calls up the ControlBlock Status screen. For configuration use only.

DISPLAYS. Call up frequently used displays. Each key displays a command line in the upper-left corner of the screen. Type the name of the display after the command line and press [ENTER].

NOTE: The key labels list the default displays for the keys. A configurator can change displays associated with the keys.
STORAGE ALARM. Calls up Disk Event List.
SYSTEM ALARM. Calls up Active System Status screen.
HDWR ALARM. Calls up Active Hardware Alarm screen.
PROCESS ALARM. Calls up Active Process Alarm screen.
ACTIVE ALARM. Calls up source of highest priority active alarm.

ACKNOWLEDGE ALARM. Acknowledges and clears alarm message from screen.

Operator Keyboard Alarm and Numeric Entry
SUPERVISORY COMPUTER. Puts controller block into one of two Supervisory control modes: COMP SP or DDC.

LSP/B. Displays field at top of block faceplate for setpoint of controller. Type setpoint value and press [Enter].

RATIO/BIAS. Displays field at top of Ratio Bias block faceplate. Check with a configor for further clarification.

AUTO. Puts controller in Auto mode.

OUTPUT. Displays field at top of block faceplate for output of controller. Type output value and press [ENTER].

OPERATOR. Puts controller in Operator (Manual) mode.

Operator Keyboard Continuous Loop Operation

SUPERVISORY COMPUTER

LSP/B

RATIO/BIAS

AUTO

OUTPUT

OPERATOR

Setpoint slewing keys

Output slewing keys
SUPERVISORY COMPUTER. Puts controller into one of two Supervisory control modes: COMP SP or DDC.

ON/OFF. Turns “on” or “off” a discrete input. When on, bit value is 1; when off, bit value is 0. These keys do not work with all motor and valve controllers.

AUTO. Puts controller into Auto mode.

OPERATOR. Puts controller into Operator (Manual) mode.

**Operator Keyboard Discrete Loop Operation**
OP: 1-8

OPTION. Calls up the previous or next options among a list of choices. In this manual, the option key is referred to as [NEXT OPTION].

RECL. Recalls the previously displayed screen.

HOME/MENU. Moves cursor to the upper-left corner of the screen. If the cursor is already in the home position, this key can call up a user-defined menu.

EXCH. Exchanges displays. For example:
- Between screens, such as Discrete Faceplate screen and Continuous Faceplate screen.
- Between configuration mode and viewing mode on a Process Graphic screen.

ENTER/MARK. Marks screens. The [RECL] key will recall marked screens in the order they are marked and clear the mark. Up to five screens can be marked at one time.

CRT. Not functional for single CRT MTCC systems.

SELECT/DISP. Selects items or functions on a display.

Cursor Operation
Function Keys on MTCC Configuration Keyboard

- **F1**: Reserved for configuration use only.
- **F2**: Exchanges screens.
- **F3**: Exchanges screens.
- **F4**: Exchanges screens.
- **F5**: Last option. Selects field items or functions on display.
- **F6**: Next option. Accesses next option among a list of choices.
- **F7**: Next option. Accesses next option among a list of choices.
- **F8**: Next option. Accesses next option among a list of choices.
- **F9**: Last option. Accesses previous option among a list of choices.
- **F10**: Recalls the previously displayed screen.
- **F11**: Displays the default drive Disk Directory screen.
- **F12**: Displays Block References screen for an entered tag.

- **TAG/ADDR**: Selects field items or functions on display.
- **BLOCK FACE**: Next option. Accesses next option among a list of choices.
- **BLOCK DIAG**: Last option. Accesses previous option among a list of choices.
- **BLOCK LINKS**: ALARM ACK. Acknowledges and clears alarm message from screen.
- **EXCH**: RECL. Recalls the previously displayed screen.
- **SELECT**: BLOCK REF. Displays Block References screen for an entered tag.
- **LAST OPTION**: DISK DIR. Displays the default drive Disk Directory screen.
- **NEXT OPTION**: NEXT OPTION.
- **ALARM ACK**: NEXT OPTION.
- **RECL**: NEXT OPTION.
- **SELECT**: NEXT OPTION.
Section 2: Displays

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Using the Display Keys ................................. 2-20
Accessing Displays on a Password-Secure System

To access any displays on a password-secure RS3, you must log in. Logging in requires a username (login) and a password.

Logging in to a Password-Secure System

This section explains how to log in to an RS3 password-secure system from your operator keyboard.

- **To log in to the console:**
  1. From the command line, type `LI [ENTER]`

  **NOTE:** The name of the last person logged in automatically appears in the “Login” field; however, if this person has a time-restricted login, the “Login” field becomes blank.

  2. Cursor to the “Login” field; type your login name as defined by the system manager, and press [ENTER].

  3. Type your password, and press [ENTER].
Changing a Password

CAUTION

If the backup node for the $$PASSWD file is down when you change your password, you should contact the system manager to copy the file from the primary to the backup node.

To change a password while logged on to the console:

1. On the command line, type
   
   CUP [ENTER]

2. Cursor to the “OLD PASSWORD” field; type the current password, and press [ENTER].

   The field changes to “NEW PASSWORD”.

3. Type a new password with 6 to 16 characters, and press [ENTER].

   The field changes to “REPEAT PASSWORD”.

4. Type the new password again, and press [ENTER].

   If both entries (Steps 2 and 3) match, the console recalls the display that was on the screen before you issued the “CUP” command.
To change a password without first logging on to the console:

1. On the command line, type
   
   LI [ENTER]
   
   The Login screen appears with a message that indicates the password must be updated.

2. Cursor to the “OLD PASSWORD” field; type the current password, and press [ENTER].
   
   The field changes to “NEW PASSWORD”.

3. Type a new password with 6 to 16 characters, and press [ENTER].
   
   The field changes to “REPEAT PASSWORD”.

4. Type the new password again, and press [ENTER].
   
   If both entries (Steps 2 and 3) match, the console recalls the display that was on the screen.

Logging Off the Console

Logging off a console can occur in one of two ways:

- If you are assigned an automatic log off, the system logs you off if the console remains untouched for the period of time specified on your User Name Detail screen.
- You can log yourself off the console from the command line.

To log off the console:

- From the command line, type
  
  LO [ENTER]
  
  The Login screen appears and the user name on the bottom line of the screen is “NO USER”. 
Controller Displays

You can monitor and control continuous and discrete ControlBlock functions in your plant using special screen displays called faceplates. Faceplates provide prompts and bar graphs to measure and manipulate controller continuous and discrete values. The RS3 system provides several different types of faceplates showing different levels of detail for both continuous and discrete data.

Continuous Displays

The figure below compares three different ways of displaying continuous data.

Comparison of Continuous Values on Group, Unit, and Overview Displays
Discrete Displays

The figure below compares three different ways of displaying discrete data.

Comparison of Discrete Values on Group, Unit, and Overview Displays
Group Display

A group display may contain up to eight faceplates that are related in some way. You can call up a group display from the Group Directory screen. If callup buttons are designated for group display, you can also call up the display by selecting the appropriate callup button on the Options Keyboard.

- To call up a group display from the options keyboard:
  - Press the callup button configured for the group display.

- To call up a group display from the Group Directory screen:
  1. Type GD: [ENTER] to call up the Group Directory screen.
  2. Cursor to the desired group.
  3. Press [SELECT].

**GROUP DIRECTORY**

<table>
<thead>
<tr>
<th>Group number</th>
<th>Group Title</th>
<th>Group Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>STARCH TO STORAGE</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PUMP M 2672</td>
<td>REACTOR CONTROLS</td>
</tr>
<tr>
<td>3</td>
<td>STARCH FLOW-100</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>BOILER MASTER</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>BOILER A</td>
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<td>BOILER B</td>
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</tr>
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<td></td>
</tr>
<tr>
<td>11</td>
<td>&gt;SEPARATION 1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>REACTOR CONTROLS</td>
</tr>
<tr>
<td>13</td>
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<td></td>
</tr>
</tbody>
</table>

**Calling Up a Group Display**

- Discrete Faceplates
- Continuous Faceplates

RS3: Operator's Guide
Displays
To call up a ControlBlock:

1. Cursor to the faceplate tag. The faceplate is highlighted.
2. Press [SELECT]. The faceplate screen for the block appears.

Calling Up a ControlBlock

Steps in MANUAL  Block Mode=AUTO

CONFIG 1
Unit Display

A unit display is condensed information from up to four group displays. Unit displays only provide information; they cannot be used to make control adjustments.

- **To call up a unit display:**
  - Type UD: [ENTER] to call up the Unit Directory and press [SELECT] on a desired unit name.

- **To call up a group display:**
  - Cursor to the desired group name and press [SELECT].

### Continuous controllers

<table>
<thead>
<tr>
<th>Group name</th>
<th>Unit number</th>
<th>Conditional status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve A</td>
<td>DVC100</td>
<td>run</td>
</tr>
<tr>
<td>close</td>
<td>DVC200</td>
<td>run</td>
</tr>
<tr>
<td>failed A</td>
<td>DVC300</td>
<td>stop</td>
</tr>
<tr>
<td></td>
<td>DVC400</td>
<td>run</td>
</tr>
<tr>
<td></td>
<td>DVC500</td>
<td>close</td>
</tr>
</tbody>
</table>

### Discrete controllers

- **Group > 1**
  - **Sequencer - Motors**
    - 11-Jul-92 15:22:19
    - Ti-101
      - 512.5
    - Ti-101 Trend
      - 518.5
    - Ti-101 Trend
      - A

- **Group > 2**
  - **Reactor Temp Profile**
    - Ts101
      - 518.54
    - 500.1
    - 478.2
    - Ti-101
      - 512.5
    - 518.5
    - 497.0

- **Group > 3**
  - **Expndr & Comprs Ctl**
    - Fc-415
      - A
    - Pt302
      - A
    - Fc302
      - A
    - Fc303
      - TOTUnit
        - 12.0
      - 0.90
      - A

- **Group > 4**
  - **Event Production Rprt**
    - TRIGGER
      - To Log OFF A
    - OPER 1
      - TOT130
        - A
      - TOT131
        - A
      - TOT131
        - A

---

**Unit Display**

RS3: Operator’s Guide
Displays
Overview Display

Overview displays consist of two condensed unit displays. Up to 64 controllers can be represented in an overview display. Overview displays only provide information; they cannot be used to make control adjustments.

To call up an overview display:
- Type OD: [ENTER] to call up the Overview Directory and press [SELECT] on a desired overview name.

To call up a group display:
- Cursor to the desired group and press [SELECT].

To call up a unit display:
- Cursor to the desired unit and press [SELECT].

PLANT OVERVIEW

Unit # 1

<table>
<thead>
<tr>
<th>Tank 1</th>
<th>Tic201</th>
<th>Fic101</th>
<th>Pic301</th>
<th>Test</th>
<th>Test</th>
<th>Valve</th>
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<td>failed O</td>
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Unit # 2

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<tr>
<th>PIC001</th>
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<td>0.00</td>
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<td>252 lbs</td>
<td>0.00</td>
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<td>560 GPM</td>
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<th>LIC101</th>
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<th>FQI102</th>
<th>Valve</th>
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<td>M</td>
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Mode
- Deviation bar PV equal to SP
- Continuous value on discrete block
Graphics

Graphic displays are pictorial representations of plant environments that are configured by the user. You can perform control operations on them through permanent faceplates, pop-up faceplates, and direct discrete or analog entries.

- To call up a graphic display from the options keyboard:
  - Press the callup button configured for the display.

- To call up a graphic display using a callup command, type:
  - \texttt{PG: (volume, filename)} [ENTER]
  - or
  - \texttt{PG: (node \#, filename)} [ENTER]

Calling Up a Graphic Display
Viewing Graphics

The actual graphic could be larger than what is displayed on the console at any one time. You can view any part of the graphic by rolling the trackball in the desired direction.

Roll the trackball to move around the graphic display.

The field of view changes as the trackball is rolled.

Moving Around a Graphic with the Trackball

Cursor control (trackball)
**Faceplates**

Graphics can be configured to include pop-up faceplates (and permanent faceplates). You can control plant discrete and analog values from the faceplates.

**NOTE:** Pop-up faceplates display a priority (PR) and plant unit (PU) number below the output bar. These numbers are used for sorting and directing alarms to the console. For more information, see the Console Configuration manual.

- **To pop-up a faceplate:**
  - Cursor to the device to be operated and press [SELECT]. The faceplate pops up. The device can then be controlled through the faceplate.

---

*Pop-up Faceplate on a Graphic Display*
Direct Discrete or Analog Control

Graphic displays can be designed to enable you to control discrete operations directly without the use of faceplates. A caret (>) symbol followed by a discrete status (e.g., open, start, off, etc.) indicates that you can control discrete functions directly on the graphic display.

- To enter a discrete command:
  - Cursor to the caret (>) for the device to be controlled and press [ENTER]. The discrete state of the device changes.

- To change an analog value:
  1. Cursor to caret (>) for the device to be controlled. The cursor appears above the device value.
  2. Type a new value and press [ENTER].

Direct Discrete Control on a Graphic Display
Reports

Reports display information about operations. Reports can be printed or viewed on the screen. They can be generated as a result of time events, alarms, and other conditions.

---

SHIFT DATA

DATE PRINTED: 4-Jul-92
TIME PRINTED: 02:45:53

WEST PLANT OPERATIONS

<table>
<thead>
<tr>
<th>TAG</th>
<th>DESCRIPTOR</th>
<th>TOTAL</th>
<th>UNITS</th>
<th>VALUE</th>
<th>UNITS</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOT130</td>
<td>OXYGEN PROD</td>
<td>37198.</td>
<td>SCuft</td>
<td>7193.3</td>
<td>SCFM</td>
<td>82830.</td>
</tr>
<tr>
<td>TOT131</td>
<td>NITROGEN PROD</td>
<td>31636.</td>
<td>CUFT</td>
<td>10000</td>
<td>SCFM</td>
<td>81555.</td>
</tr>
<tr>
<td>TOT132</td>
<td>ARGON PROD</td>
<td>33197.</td>
<td>CUFT</td>
<td>9984.2</td>
<td>SCFM</td>
<td>81541.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>PRODUCT VOL.</td>
<td>1.0203</td>
<td>MCFT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ENERGY CONSUMPTION & PRODUCTION EFFICIENCIES

| JT130  | POWER LINE 1   | 1.78   | KW-HR | 24.6   | KW    | 85934.|
| JT131  | POWER LINE 2   | 3.67   | KW-HR | 254.0  | KW    | 85936.|
| JT132  | POWER LINE 3   | 5.06   | KW-HR | 350.0  | KW    | 85937.|

***END OF REPORT***

Sample Report Display
Calling Up Reports

You can access reports through the Report Read Directory and the Report File Contents screens. The Report Read Directory lists the report files that you can access. In turn, each report file has a Report File Contents screen that lists the report displays that are available. For each report, it shows PeerWay location, number of generations, and the date of the most recent generation of a report display.

Type RRD: [ENTER]

Report Read Directory

<table>
<thead>
<tr>
<th>Filename</th>
<th>Size</th>
<th>Modification Time</th>
<th>Max#</th>
<th>Node</th>
<th>Autoprint</th>
<th>#Rpts</th>
<th>Unprnt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batch</td>
<td>29696</td>
<td>16-Jul-92 07:15</td>
<td>2</td>
<td>28</td>
<td>N</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>System</td>
<td>14554</td>
<td>15-Jul-92 09:24</td>
<td>10</td>
<td>28</td>
<td>N</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

[SELECT]

Report File Contents

<table>
<thead>
<tr>
<th>#Ent Prted?</th>
<th>Node</th>
<th>Size</th>
<th>Pages</th>
<th>Lines</th>
<th>Generated</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>30</td>
<td>2603</td>
<td>1</td>
<td>12</td>
<td>16-Apr-90 07:15</td>
<td>16-Jul-92 07:15</td>
</tr>
<tr>
<td>No</td>
<td>30</td>
<td>2603</td>
<td>1</td>
<td>12</td>
<td>16-Apr-90 06:15</td>
<td>16-Jul-92 06:15</td>
</tr>
</tbody>
</table>

[SELECT]

Calling Up Reports

RS3: Operator’s Guide
Report Read Directory

The Report Read Directory lists the available reports files. You can use this screen to:

- Select a report filename
- Change the sort criterion
- Change the sort order

To call up a Report Read Directory, type:

RRD: [ENTER]

To change the sort criterion:
- Cursor to the “Description Sort Criterion” field and press [NEXT OPTION].

To change the sort order:
- Cursor to the “Sort Order” field and press [NEXT OPTION].

To call up the Report File Contents screen:
- Cursor to a report file and press [SELECT].

Sample Report Read Directory
Report File Contents Screen

The Report File Contents screen lists the report displays for a report filename. You can select individual report displays to view on the screen or print. Each report file can have up to a maximum of 10 report displays.

- To call up a Report File Contents screen:
  - From the Report Read Directory, cursor to a report field and press [SELECT].
  - or
  - From the command line, type:
    RFC [ENTER]

- To call up a report display from the report file:
  - Cursor to the report filename and press [SELECT].

- To print a report display from the report file:
  - Cursor to the report filename and press [ENTER].

Sample Report File Contents Screen
Report Displays

A new report display is generated each time a report file is opened and new data is written to the report file (for this reason, report displays are sometimes called report generations). Each report file can have a maximum of 10 report displays.

- **To call up a report display:**
  - From the Report File Contents screen, cursor to a report display field (indicated by entry number) and press [SELECT].
  
  or

- From the command line, type:
  
  RR: (, filename) [ENTER]

- **To change the report file:**
  - Type the report filename in the "Filename" field and press [ENTER].

- **To change the report display:**
  - Type the report display number in the "Print entry #" field and press [ENTER].

---

Filename: >PLANT Print entry #:1 (1=newest, 99=oldest entry) Generated on 13-Jul-92, from 15:44:30 to 15:44:32 Lines: 20

WEST PLANT OPERATIONS

<table>
<thead>
<tr>
<th>TAG</th>
<th>DESCRIPTOR</th>
<th>TOTAL</th>
<th>UNITS</th>
<th>VALUE</th>
<th>UNITS</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOT130</td>
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<td>SCUFT</td>
<td>7193.3</td>
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<tr>
<td>TOT131</td>
<td>NITROGEN PROD</td>
<td>31636.</td>
<td>CUFT</td>
<td>10000.</td>
<td>SCFM</td>
<td>81555.</td>
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<td>33197.</td>
<td>CUFT</td>
<td>9984.2</td>
<td>SCFM</td>
<td>81541.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>PRODUCT VOL.</td>
<td>1.0203</td>
<td>MCFT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ENERGY CONSUMPTION & PRODUCTION EFFICIENCIES

---

Calling Up a Report Display
Using the Display Keys

The display section of the operator keyboard contains dedicated keys for calling up commonly used displays. The list below shows several keys that call up directories or special screens when used in conjunction with the [DIRECTORY] key.

**NOTE:** The list below shows the default values of the display keys. The configuror can change the key default values to perform functions other than those listed below.

<table>
<thead>
<tr>
<th>Display Section</th>
<th>Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Directory</td>
<td>[GROUP DISPLAY] [DIRECTORY]</td>
</tr>
<tr>
<td>Overview Directory</td>
<td>[OVERVIEW] [DIRECTORY]</td>
</tr>
<tr>
<td>Process Graphic Directory</td>
<td>[PROCESS GRAPHIC] [DIRECTORY]</td>
</tr>
<tr>
<td>Trend Display Menu</td>
<td>[TREND] [DIRECTORY]</td>
</tr>
<tr>
<td>Report Read Directory</td>
<td>[REPORT] [DIRECTORY]</td>
</tr>
</tbody>
</table>

Using the Display Keys
Section 3: Continuous Control

Continuous Control Overview .................................. 3-2
Continuous Faceplate ............................................ 3-3
Continuous Faceplate Symbols ................................. 3-4
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Changing the Setpoint .......................................... 3-8
Changing the Output ............................................ 3-10
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Continuous Control Overview

Continuous control involves changing the relationship between a measured input signal to a controller and the controller’s output signal. An input signal is generated by a measuring device at a specific point in the process. The controller compares the measured value against a reference value called the setpoint. If the controller senses any difference between the two, it sends an output signal to a device such as a valve or motor to make an adjustment in the process.

In the following illustration, a flow transmitter (FT) senses flow through a process and sends a measurement (PV) to the controller. The controller compares the flow measurement with the flow setpoint and sends an output signal to the outflow valve to adjust flow equal to the setpoint.
Continuous Faceplate

The continuous faceplate allows you to view operating conditions for a control loop and to make control adjustments. Continuous variables such as setpoint, ratio, and output can be configured with high, low, and rate of change limits. If the variable reaches one of these limits, the console displays the following message:

Limit has been reached

In addition, in Auto mode the continuous faceplate indicates when an output high or low limit has been reached.

Controller input labels:
- PV = process variable
- LSP = local setpoint
- RSP = remote setpoint
- FF = feed forward

Descriptor—Pressing [EXCH] displays the controller tag

Typical Continuous Faceplate
Continuous Faceplate Symbols

Symbols can appear on the continuous faceplate display in the following locations.

Placement of Symbols on a Continuous Faceplate Display
Continuous Faceplate Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Color</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbol]</td>
<td>White</td>
<td>1</td>
<td>The input is linked from an input block or from another controller.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>White</td>
<td>1</td>
<td>The value may be adjusted using the slewing keys on the Operator Keyboard.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>White</td>
<td>2</td>
<td>The output has reached its low limit.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>White</td>
<td>2</td>
<td>The output has reached its high limit.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>Yellow</td>
<td>1</td>
<td>Rate limit has been reached.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>Red or Yellow</td>
<td>1</td>
<td>Deviation Alarm. Color indicates alarm state: red = critical; yellow = advisory.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>White</td>
<td>1</td>
<td>Invalid input. Indicates a configuration error (try to link a block with hardware address to nonexistent block).</td>
</tr>
</tbody>
</table>
## Continuous Faceplate Symbols (continued)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Color</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Green Arrow]</td>
<td>Green</td>
<td>1</td>
<td>The output or setpoint is being controlled by a logic function. The controller, therefore, may not currently be responding to its own setpoint.</td>
</tr>
<tr>
<td>![Green Arrow]</td>
<td>Green</td>
<td>2</td>
<td>The output is being forced to track another variable. The controller, therefore, is not currently responding to its own setpoint. This commonly occurs at the output of the primary controller in a cascade loop when the secondary is in either the Auto, Manual, or Local modes.</td>
</tr>
<tr>
<td>![White Arrow]</td>
<td>White</td>
<td>1,2</td>
<td>The output or setpoint is being controlled by a logic function. The controller, therefore, may not currently be responding to its own setpoint.</td>
</tr>
<tr>
<td>![Red or Yellow Arrow]</td>
<td>Red or Yellow</td>
<td>1,2</td>
<td>An alarm limit has reached the high limit. The color of the arrow indicates whether it is a critical or an advisory alarm.</td>
</tr>
<tr>
<td>![Red or Yellow Arrow]</td>
<td>Red or Yellow</td>
<td>1,2</td>
<td>An alarm limit has reached the low limit. The color of the arrow indicates whether it is a critical or an advisory alarm.</td>
</tr>
<tr>
<td>![Green Arrow]</td>
<td>Green</td>
<td>1</td>
<td>The signal to the controller is lost because: transmitter or I/O hardware fails, input controller is switched to Manual mode, or a link from input I/O hardware fails.</td>
</tr>
</tbody>
</table>
Selecting the Mode

You can change the controller mode using the loop operation panel at the MTCCs. The block cannot be changed to Local mode from the MTCC or Hardened Command Console operator keyboard.

- To select Computer mode:  
  - Press [SUPERVISORY COMPUTER].

- To select Remote mode:  
  - Press [REMOTE].

- To select Auto mode:  
  - Press [AUTO].

- To select Operator (Manual) mode:  
  - Press [OPERATOR].

Selecting Controller Modes
Changing the Setpoint

The setpoint value is indicated by the position of the setpoint bar and the setpoint numerical value. You can change the setpoint from a continuous faceplate by:

- Pressing and holding the slewing keys on the console.

  or

- Pressing the setpoint change key and entering the setpoint at the top of the faceplate from the numeric keypad.

**NOTE:** A pop-up faceplate on a process graphic displays both the setpoint and output field at the top of the faceplate in white. Remember which change key you press.

![Diagram of continuous control system](image)

**Changing Setpoint with the Slewing Keys**

RS3: Operator’s Guide  Continuous Control
To change the setpoint by directly entering a value:
1. Press [LSP/B].
2. Enter the new setpoint at the top of the faceplate.

Changing Setpoint by Directly Entering a Value
Changing the Output

The output value is indicated by the position of the output bar and the output numerical value. You can control the output from a continuous faceplate while it is in Manual or Local mode by:

- Pressing and holding the slewing keys on the console.

  or

- Pressing the output change key and entering the output at the top of the faceplate from the numeric keypad.

**NOTE:** A pop-up faceplate on a process graphic displays both the output and setpoint field at the top of the faceplate in white. Remember which change key you press.

![Diagram of the faceplate showing output control options]

**Changing Output with the Slewing Keys**
To change the output by directly entering a value:
1. Press [OUT].
2. Enter the new output value at the top of the faceplate.

Changing Output by Directly Entering a Value
Cascade Control

Cascade control consists of two control loops—a primary loop and a secondary loop. The primary loop, which is the slower-acting loop, provides the setpoint for the faster secondary loop.
Adjusting a Cascade Loop—Secondary Controller in Remote

The following illustration shows two faceplates for a primary and secondary control loop. In a typical cascade control loop, the primary loop output must be in the Auto mode and the secondary loop must be in the Remote mode in order for the secondary loop to respond to changes in the primary setpoint. The output of the primary loop is automatically used as the setpoint of the secondary loop. In this situation you cannot adjust the secondary setpoint.

To adjust a cascade loop:
1. If necessary, cursor to the faceplate for the primary loop and press [AUTO].
2. Press and hold slewing keys to adjust the primary loop setpoint.

Automatic Cascade Control—Secondary Controller in Remote
Adjusting Setpoint of the Secondary Controller in a Cascade Loop

To adjust the secondary controller setpoint directly, you must break the cascade control loop. The following illustration shows two faceplates for a primary and secondary control loop that have been broken. If the secondary loop is in Auto, you can adjust the secondary loop setpoint. To resume cascade control of the loop, switch the secondary controller back to the Remote mode.

CAUTION
If tracking is not configured, the secondary setpoint might change when you switch the secondary controller back to remote.
To adjust the setpoint of the secondary loop:
1. Cursor to the faceplate for the secondary loop and press [AUTO].
2. Press and hold slewing buttons to adjust the secondary loop setpoint.

Setpoint Control—Secondary Controller in Auto
Adjusting Output of the Secondary Controller in a Cascade Loop

To adjust the secondary controller output directly, you must break the cascade control loop. The following illustration shows two faceplates for a primary and secondary control loop that have been broken. If the secondary loop is in Manual, you can adjust the secondary loop output. To resume cascade control of the loop, switch the secondary controller back to the Remote mode.

CAUTION
If tracking is not configured, the secondary setpoint might change when you switch the secondary controller back to Remote.
To adjust the output of the secondary loop:
1. Cursor to the faceplate for the secondary loop and press [OPERATOR].
2. Press and hold slewing buttons to adjust the secondary loop output.

Setpoint Control—Secondary Controller in Manual
Ratio and Bias Control

Ratio control is used to mix two or more flows together continuously in a predetermined fraction or ratio. The master flow measurement is multiplied by the ratio value to determine the setpoint for the slave flow controller. A bias value may also be used in slave setpoint determination to add or subtract a small amount from the master flow value.

There are several ways to configure faceplates to provide for adjustment of the ratio and bias values. In some cases where both ratio and bias values are used, only one, or perhaps neither, are adjustable from an operating display. The following paragraphs describe the most common configurations and show how adjustments are made. These include:

- Ratio or bias only using a single faceplate
- Ratio or bias only using two faceplates
- Ratio and bias, with only one adjustable, using two faceplates
- Ratio and bias, with both adjustable, using two faceplates

**Legend:**
- BI Bias term
- LS Local setpoint
- PV Process variable
- Q Output
- RA Ratio term
- RS Remote setpoint

**Calculation of Slave Flow Remote Setpoint**
Ratio or Bias Control Using a Single Faceplate

With this configuration only the ratio value can be adjusted from the faceplate. The setpoint slewing buttons and [LSP/B] act on the ratio value. Therefore, you cannot adjust the Local Setpoint even when the loop is in the AUTO mode.

The same approach can be used for bias control, with the bias value being substituted for the ratio value.

To change the ratio value:
1. Cursor to the faceplate for the slave flow controller.
2. Change the ratio value:
   a. Press and hold one of the slewing keys.
   or
   b. Press [LSP/B], type a new value at top of faceplate from the numeric keypad, and press [ENTER].

Slave flow will be one half of master flow.

Ratio Controller with Ratio Adjustment on a Single Faceplate
Ratio or Bias Control Using Two Faceplates

This configuration allows manual adjustment of the slave flow setpoint with the slave controller in the AUTO mode. This permits independent control of the slave flow during startup, shutdown, or under abnormal conditions.

Ratio, bias, or both may be configured for use in such a case. Either or both may be adjustable through the faceplate by entering a new value from the numeric keypad. A caret (>) symbol will appear to the left of the value if it is adjustable.

To change the ratio or bias value:
1. Cursor to the faceplate containing the entry field.
2. Cursor to the space above the present value.
3. Using the numeric keypad, type in the new value.
4. Press [ENTER] to complete the change.

Ratio and Bias Control Using Two Faceplates
Section 4: Discrete Control

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Operating Restrictions and Conventions .................... 4-11
Discrete Control Overview

Discrete control is used to position a device in one of two operational states, such as open or closed, on or off, start or stop. In this two-state control action, there is only a maximum or a minimum signal (on or off).

The illustration below shows a discrete control loop. The operator starts the pump with a switch or button and the automatic controller sends a start signal to the Motor Control Center (MCC), which provides the motor power to start the pump. A confirmation signal in the form of a contact closure is then sent from the MCC back to the automatic discrete controller. If the confirmation signal is not received within a preset time, the controller sends a stop signal to the MCC. In the same manner a stop signal is sent from the controller to the motor to shut it off. An automatic start/stop signal can be used instead of the operator entry.
Discrete Faceplate

Discrete faceplates can display up to 17 lines of information, such as equipment status, continuous variable value, control output confirmation, and various symbols.

The following illustration shows examples of discrete faceplates. You can change fields that start with a caret (>). Discrete fields include on/off, start/stop, etc. The discrete field functions in one of the following ways while under operator control:

- **Momentary**: Turns on or off for one second.
- **Sustained**: Turns on or off until changed.
- **Select**: Only one switch of a group can be on at a time.

To start a discrete device from a discrete faceplate:
1. Cursor to > start.
2. Press [ENTER].

Motor starts and the controller receives device confirmation. Output indicates device state.

Group 2: MOTOR CONTROLS

<table>
<thead>
<tr>
<th>Desc</th>
<th>PUMP 1</th>
<th>BLOWER 5</th>
<th>FLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OPERATOR</td>
<td>OPERATOR</td>
<td>AUTO</td>
</tr>
<tr>
<td>2</td>
<td>start</td>
<td>&gt; start</td>
<td>Enter</td>
</tr>
<tr>
<td>3</td>
<td>stop</td>
<td>&gt; stop</td>
<td>Dosage</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>Setpoint</td>
</tr>
<tr>
<td>5</td>
<td>---AUTO---</td>
<td>---AUTO---</td>
<td>--OUTPUT--</td>
</tr>
<tr>
<td>6</td>
<td>start</td>
<td>start</td>
<td>RUN</td>
</tr>
<tr>
<td>7</td>
<td>stop</td>
<td>stop</td>
<td>---OUTPUT--</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>FLOW</td>
</tr>
<tr>
<td>9</td>
<td>on cf rm</td>
<td>on cf rm</td>
<td>42.6</td>
</tr>
<tr>
<td>10</td>
<td>off cf rm</td>
<td>off cf rm</td>
<td>GPM</td>
</tr>
<tr>
<td>11</td>
<td>tripped</td>
<td>tripped</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>AUTO</td>
<td>AUTO</td>
<td></td>
</tr>
</tbody>
</table>

Typical Discrete Faceplate
Numerical Entries on a Discrete Faceplate

You can enter a numerical value on discrete faceplates if it starts with a caret (>) symbol. Continuous fields show numeric values for process variables.

To change a continuous value on a discrete faceplate:

1. Cursor to the value and type a new value.
2. Press [ENTER]. The new value appears.

Continuous Control from a Discrete Faceplate
Motor and Valve Controllers

The RS3 has standard functions available to control motors and valves. You can control these motors and valves manually through their faceplates.

Motor Controllers

The following illustrations describe the motor controllers and their functions. They also show the motor controller faceplates.

Motor Controller (DMC)
A single-speed electric motor.

Auto Sequence Motor Controller (DASMC)
A single-speed electric motor which is one of several that must be automatically started in a certain order.

Motor Controller Faceplates
Dual Speed Motor Controller (DDSMC)
A two-speed electric motor.

Dual Direction Motor Controller (DDDMC)
A reversible electric motor.

**Motor Controller Faceplates (continued)**
Valve Controllers

The following illustrations describe the valve controllers and their functions. They also show the valve controller faceplates.

Valve Controller (DVC)
Any valve, such as a solenoid valve, which requires a contact closure to maintain the open position, closed position, or both.

Valve Controller Faceplates
Auto Sequence Valve Controller (DASVC)
Similar to DMC, except the valve is one of several which must be automatically opened in a certain order.

Motorized Valve Controller (DMVC)
Motorized valve operators, which require a contact closure to change position but not to maintain position.

Valve Controller Faceplates (continued)
# Controller Modes

The following table lists the motor and valve controller modes and what actions an operator can take in each mode.

## Motor and Valve Controller Modes

<table>
<thead>
<tr>
<th>Controller Mode</th>
<th>Operator Actions Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO</td>
<td>Block responds only to Auto commands (e.g., start, stop, open, close, etc.) and ignores commands from the keyboard.</td>
</tr>
<tr>
<td>MANUAL or OPERATOR</td>
<td>Block responds only to Manual keyboard (operator-entered) commands and ignores Auto commands. Press the [Operator] key to select the Manual mode.</td>
</tr>
<tr>
<td>LOCAL</td>
<td>Local is not a useful operating mode for a motor or valve controller.</td>
</tr>
<tr>
<td>COMP SP or DDC</td>
<td>COMP SP and DDC are not used by a motor or valve controller.</td>
</tr>
</tbody>
</table>
Device State Indicators

Motor and valve controllers use several indicators to display device states on the controller faceplate.

Case letters  Uppercase letters (for example, OPEN) indicate that the device state is active. Lowercase letters (e.g., open) indicate the device state is not active.

Backlighting  Some device states are backlit when active.

Color  Indicates the criticality of the device state:

Green  The device state is not critical.

Blue  The device state is neutral.

Yellow  The device is performing a noncritical action. For example, if the "Travel" state is yellow, the valve stem is in the process of opening or closing.

Red  The device state is critical. For example, if the interlock state is red, the interlock condition is false and the device cannot function.
Operating Restrictions and Conventions

Below are certain operating restrictions and special features that you should be aware of when operating motor or valve controllers.

Confirmation Signals

Confirmation signals are typically found in rows 10 and 11 of the motor controller faceplate and rows 10 and 12 of the valve controller faceplate. Row 10 is the On or Open Confirm and row 11 or 12 is the OFF or Closed Confirm. Under normal operation, an On Confirm is backlit when the motor is started. The Off Confirm is an optional field that indicates when the motor goes off.

Interlocks

Interlocks are an option with most motor and valve controllers. If configured, the interlock sets a condition that must be true in order to start a motor or to keep it running. If the interlock is not true, you will not be able to start a motor; if the motor is on, it shuts off.

Retry

If the retry option is configured, the controller automatically tries to restart the motor a preset number of times after an unsuccessful start. If the motor does not start within the preset number of retries, it goes into a lockout for a preset period of time. No retries can be attempted until that lockout period of time has elapsed.

Security Lockup

The security lockup option prevents restart attempts after a tripped condition. A reset signal has to be received from a source defined by the configuror in order to clear the block for a restart.

Tripped Condition

A motor may be tripped in response to a number of system faults. For example:

- If power temporarily fails.
- If an “On Confirm” disappears
- If a motor does not respond within a set time.

The faceplate shows that the motor has failed.
Failed

Indicates that a motor has failed. If the tripped motor or stuck valve has caused the motor to fail, perform the following two-step process to start the device again:

- **Motor has tripped**
  1. Cursor to the “Stop” field on the faceplate and press [ENTER].
  2. Cursor to the “Start” field and press [ENTER].

- **Valve is stuck open**
  1. Cursor to the “Open” field and press [ENTER].
  2. Cursor to the “Close” field on the faceplate and press [ENTER].

Travel

Indicates that the valve stem is somewhere between the open and closed positions.

Enable

Indicates that the DASMC block can start running. Before the DASMC can be enabled, the following must be true:

- The Interlock condition has been met.
- The DASMC block time delay has expired.
- The DASMC block has received an “ON CFRM” message from a previous device in the operation sequence.
Section 5: Trending

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Calling Up a Controller From a Trend Display ....... 5-4
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  Changing the Scaling Limits ............................. 5-5
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Trend Displays

Trend displays record the value of variables over a period of time, similar to what a chart recorder does. Any variable available from a controller can be trended. A trend display shows data for up to four variables in a trend group. Up to 400 trend groups can be configured for a console.

Sample Trend Display
Calling up a Trend Display

You can call up trend display from the keyboard or from the Trend Group Menu.

- To call up a trend display from a configuration keyboard:
  - At the display command line, type:
    
    \[
    TG: \text{ (group number) [ENTER]}
    \]

- To call up a trend display from the Trend Group Menu:
  1. Type \text{TGD: [ENTER].} The Trend Group Menu appears.
  2. Cursor to the trend group name, and press [SELECT].

Calling up a Trend Display from Trend Group Menu
Calling Up a Controller From a Trend Display

You can call up related displays for the controllers represented in a trend display. If the controller is included in a group display, the group display is called up. Otherwise, the controller’s configuration screen is called up.

To call up a group display from a trend display:

- Cursor to the controller tag and press [SELECT]. On a group display, the controller display appears with a boxed-in faceplate.

Calling Up a Group Display from a Trend Display
Changing Engineering Units of Measure

Engineering units of measurement are represented by:

- Scaling limits
- The measurement scale

Changing the Scaling Limits

There are two ways you can change the scaling limits:

- Change the units of measurement scaling on the left side of the trend. The units of measurement scale is associated with the tag displayed on the left side of the trend below the scale.
- Change the percent scaling on the right side of the trend. The percent scale is a relative value of 0 to 100%.

To change scaling limits:
1. Cursor to the scaling limit.
2. Type a value and press [ENTER].

To change percent scaling:
1. Cursor to the percent limit.
2. Type a value and press [ENTER].

Changing Trend Display Scaling Limits—0 to 200 KLb/Hr
A change in one scale results in a change in the other scale and in the displayed trend.

Changing Trend Display Scaling Limits—0 to 100 KLb/Hr
Changing the Measurement Scale

By changing the tag, you can change the units of measurement used by the trend display. Changing the tag does not change the trend displayed in the window.

To change the tag that determines the trend scale:

1. Cursor to this tag and press [NEXT OPTION] repeatedly to find the desired tag.
2. When the desired tag is shown in the field, press [ENTER]. New tag and units are displayed in the trend scale.

Changing the Tag Displayed on a Trend
Displaying Individual Trends

You can toggle the trend display of each variable on or off. When a display is off, the trend data is not discarded; it is simply not shown. This procedure can be done to reduce clutter in a trend display window.

To toggle the trend display of a variable on or off:

- Cursor to the tag of the trended link and press [ENTER].
  - The trend display for the tag is no longer shown and “OFF” appears in the “Value at” field.

Turning Off a Variable on a Trend Display
Viewing Historical Data

The trend displays represent variable values over a period of time. You can select the period of time with the following fields:

**Time Scale**  The amount of time represented within the display window. The first time scale field can be any number from 1 to 366. The second field indicates units of time in either minutes, hours, or days.

**Start Time**  The beginning date and time of day for the trend. The start time is represented on the left side of the display. The most recent data is represented on the right side of the display. Data on the left side is older.

**End Time**  The ending date and time of day for the trend. The end time is represented on the right side of the display. Data on the left side is older.

**NOTE:** End Time can only be used with historical data. When you select “End Time”, a current trend is automatically replaced by a historical trend.

**Trend Type**  Indicates whether the trend is a current or historical trend.

- **Current**  Indicates that the graph is showing the most current trending data and that the graph is continually updating. When you call up the trend group, the graph always displays current trending.

- **History**  Indicates that the graph is showing historical data from a previous period of time and that the graph is not updating.
Changing the Trend Time Scale

You can represent the time scale in minutes, hours, or days.

To change the time scale:

1. Type a value at the ‘Time Scale’ field and press [ENTER].
2. Press [NEXT OPTION] to get minutes, hours, or days, and then press [ENTER].

Changing Trend Time Scale
Changing the Trend Start Time

Start time is the time of the newest data on the trend graph. If you enter a time in the “Start Time” field, the field displays “History” and the trend display shows historical data.

The format for start time is HH:MM:SS; the format for date is DD-MM-YY.

NOTE:

- You can substitute a period (.) for a colon (:) in the time field.
- You can substitute a number from 1 to 12 for the month in the date field.
- You must enter a number for each value (hours, minutes, and seconds) in the time field and each value (days, months, and years) in the date field. Zero is an acceptable value.
To select a start time for a historical trend:
1. Type a start time and press [ENTER].
2. Type a start date and press [ENTER]. The trend type “History” is displayed, indicating that the trend data is from a previous period of time.

Changing Trend Start Time
Reading Trend Values at any Point In Time

You can use a slide wire feature to read precise values at any point on a trend display where you position the cursor.

To read trend values at any point in time:

- Position the cursor at a desired point inside the trend window.
  - A vertical line appears where the cursor is located.
  - The exact time at that point and values of the trended variables are displayed under the “Value at” field.

Reading Trend Display Value with a Slide Wire
NOTE: You can position the slide wire more precisely by moving the cursor up or down. As you move the cursor up, the line moves from the left to the right through the cursor; as you move the cursor down, the line moves from right to left through the cursor.
Changing the Default Time and Measurement Scales

You can define default time and measurement scales so that you do not have to reenter these values each time you call up the trend display.

For more information on the Trend Group Configuration screen, see the Console Configuration manual.

- **To call up the Trend Group Configuration screen from a trend display:**
  - Press [EXCHANGE] to toggle the screen display between the Trend Group Configuration screen and the trend display.

<table>
<thead>
<tr>
<th>Trend Group Number</th>
<th>Group Description</th>
<th>Tag</th>
<th>Descriptor</th>
<th>Node</th>
<th>File Freq.</th>
<th>Type</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drum Level</td>
<td>&gt;32</td>
<td>3</td>
<td>10 secs</td>
<td>average</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Drum Level</td>
<td>&gt;32</td>
<td>3</td>
<td>10 secs</td>
<td>average</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Drum Level</td>
<td>&gt;32</td>
<td>3</td>
<td>10 secs</td>
<td>average</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Drum Level</td>
<td>&gt;32</td>
<td>3</td>
<td>10 secs</td>
<td>average</td>
<td>Good</td>
<td></td>
</tr>
</tbody>
</table>

- **To change the default time scale:**
  - Enter a new time scale in the “Time Scale” field. The trend display will show the new time scale.

- **To change the default measurement scale:**
  - Enter a number from 1 to 4 for the tag you want to scale in the “Trend number” field. The trend display will show the measurement scale for that tag.
Trend Interruptions

You may occasionally see a trend display that appears to be interrupted by blank gaps in the graph. Interruptions typically represent periods of time when trending was disabled or no data was being collected.

Trend Graph with Interruption
Section 6: Alarms

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Alarm Annunciation

The RS3 uses alarms to alert users to problems in the system. Alarms can be announced at the console in the following ways:

- **Alarm annunciation**: Color-coded alarm banner or alarm summary containing alarm information can appear at the bottom of the screen. The color of the banner indicates the type of alarm.
- **Keyboard annunciation**: Keys on the keyboard light or blink. These keys can be used to locate the source of the alarm.
- **Audio annunciation**: The console beeps.

For a complete list of RS3 alarms, see the *Alarm Messages Manual*. 
**Alarm Display Annunciation**

All RS3 alarms are announced with an alarm banner or an alarm summary at the bottom of the screen.

**NOTE:** There are two types of process alarms:

- **Critical process alarms** Represent conditions that require immediate action.
- **Advisory process alarms** Usually represent conditions that require less urgent attention than critical process alarms.

**Alarm Banner**

The color-coded alarm banner contains alarm information.

<table>
<thead>
<tr>
<th>10:23:18</th>
<th>LIC-200/PV Drum Level High Critical 12.64 Ft. LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of alarm</td>
<td>Tag and descriptor of alarmed block</td>
</tr>
</tbody>
</table>

**Alarm Banner**
The alarm banner sometimes contains more information than can be displayed on the screen at one time (primary alarm banner). You can display more of the alarm banner text (alternate alarm banner) by moving the cursor to the banner and pressing [EXCH].

The primary alarm banner will be restored when the cursor is moved from the banner or [EXCH] is pressed again.

10:23:18 >=13 Left CP Data Integrity Error HM AC

Primary Alarm Banner

10:23:18 >=13 Left CP Data Integrity Error (21) 0-0 HM

Alternate Alarm Banner

**Primary and Alternate Alarm Banner Formats**
Alarm Summary

The alarm summary displays alarm type information, including the number of active and unacknowledged alarms. Active alarm types are also annunciated.

<table>
<thead>
<tr>
<th>Crit</th>
<th>Adv</th>
<th>Batch</th>
<th>Hard</th>
<th>Sys</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>2/3</td>
<td>0/5</td>
</tr>
</tbody>
</table>

Number of active alarms

Number of unacknowledged alarms

To enable the alarm summary mode (disable the alarm banner mode) from the command line:

- Type ASE [ENTER]

To disable the alarm summary mode (enable the alarm banner mode) from the command line:

- Type ASD [ENTER]

To enable or disable the alarm summary mode from the Alarm Configuration screen:

- Cursor to the “Summary” field and press [ENTER] to enable or disable the alarm summary mode.
Alarm Priority

Priority determines the order in which alarm types are displayed. Alarm types are prioritized as follows:

- Hardware
- Critical Process
- Advisory Process
- Batch
- System Status
- Disk Event

This is the default priority. However, the relative priority of the hardware alarm in relation to other alarms can be configured.
Alarm Colors

The color of the alarm banner indicates the type of alarm.

**Standard Alarm Colors**

<table>
<thead>
<tr>
<th>Color</th>
<th>Alarm Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Critical Process</td>
</tr>
<tr>
<td>Yellow</td>
<td>Advisory Process</td>
</tr>
<tr>
<td>Magenta</td>
<td>Hardware</td>
</tr>
<tr>
<td>White</td>
<td>System Status</td>
</tr>
<tr>
<td>Green</td>
<td>Disk Events</td>
</tr>
<tr>
<td>Orange</td>
<td>Batch</td>
</tr>
</tbody>
</table>

Block tags on graphic displays and group displays can be backlit by the following colors to announce alarms:

**Alarm Colors on Block Tags**

<table>
<thead>
<tr>
<th>Color</th>
<th>Alarm Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aqua</td>
<td>Alarm Suppressed</td>
<td>Alarm banners are not displayed on the console screen. Suppressed alarms are recorded in an Active Suppressed Alarms list.</td>
</tr>
<tr>
<td>Gray</td>
<td>Alarm Disabled</td>
<td>Alarms associated with a plant area are disabled. The configuror defines the plant equipment and operations that comprise a plant area.</td>
</tr>
<tr>
<td>Salmon</td>
<td>Alarm Inhibited</td>
<td>Alarms defined in the ControlBlock are inhibited. The configuror inhibits alarms from a controller on a block-by-block basis.</td>
</tr>
</tbody>
</table>
Keyboard Annunciation

Keys on the keyboard can light or blink to announce an alarm condition.
Display Annunciation

Faceplates and objects on process graphics can indicate controller alarms as backlit symbols and variables. The color and type of symbol indicate the alarm type.

Controller in alarm has symbols and variable backlit.

Color codes are:
- Red — Critical alarm
- Yellow — Advisory alarm

Variable values are backlit. Unacknowledged alarms also blink on group displays.

Alarms on Displays
Acknowledging Alarms

To acknowledge an alarm, press the [ALARM ACKNOWLEDGE] key at a console. Acknowledging an alarm indicates that you have recognized that the alarm exists.

Results of acknowledging an alarm:

- The alarm banner disappears from the bottom of the screen.
- Any associated variable values on group displays quit blinking. They remain backlit.
- The [PROCESS ALARM] and [ACTIVE ALARM] keys no longer blink. They remain lit.
- Any associated callup buttons that were lit and blinking no longer blink.
- Any audible alarm signal ends.

To acknowledge and clear alarm from screen:
1. If the horn is enabled, silence the horn. Type: `SH [ENTER]`
2. Press [ACKNOWLEDGE ALARM]

Acknowledge Alarm Key on Command Consoles
NOTE: If the alarm summary is displayed instead of the alarm banner, you can only acknowledge the alarm if the active alarm list is also displayed.

To acknowledge process alarms when the alarm summary is displayed:

1. Cursor to a blinking alarm in the alarm summary and press [SELECT]. The active alarm list appears.

2. Press the [ALARM ACKNOWLEDGE] key while the active alarm list is displayed to acknowledge the alarm.

When acknowledged, the alarm in the alarm summary stops blinking but will remain backlit until the alarm condition is corrected.
Responding to Alarms

To respond to an alarm, press the appropriate alarm key to call up a display for the alarm condition. Pressing the [ACTIVE ALARM] key displays all alarm conditions in the order they are generated (from oldest to the newest). However, if an alarm occurs, the [ACTIVE ALARM] key will again display the oldest alarm condition not the next newest alarm condition. Place the cursor on the caret (>) of a message. Press “a” to acknowledge the alarm, “c” to clear the alarm, “s” to suppress the alarm, or “e” to unsuppress the alarm.
The [Active Alarm] key displays alarm conditions from oldest to newest. If a hardware alarm occurs, the [Active Alarm] key will redisplay alarm conditions from oldest to newest.

Using [ACTIVE ALARM] Key
Controlling Alarm Annunciation

You can limit the alarms displayed at the console by suppressing alarms or disabling alarm areas.

Suppressing and Unsuppressing Alarms

If alarms are suppressed, they are not displayed in a banner at the bottom of the screen. ControlBlock tags on group displays and graphic display objects are backlighted in aqua to indicate that alarms for that block are suppressed. All suppressed alarms are saved in the Active Suppressed Alarms list. If assigned permission by a configuror, an operator can suppress and unsuppress alarms.
To call up Active System Status screen, type: PA [ENTER]

To suppress an active alarm:
- Cursor to alarm tag and type: S

<table>
<thead>
<tr>
<th>Occur</th>
<th>Source</th>
<th>Description</th>
<th>Summ</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:12:09</td>
<td>LIC-201/PV</td>
<td>High Advisory</td>
<td>11 Ft.</td>
</tr>
<tr>
<td>12:11:23</td>
<td>FIC-205/PV</td>
<td>Low Advisory</td>
<td>25 GPM</td>
</tr>
<tr>
<td>12:08:54</td>
<td>PIC-201/PV</td>
<td>Low Critical</td>
<td>13 PSIG</td>
</tr>
</tbody>
</table>

To call up Active Suppressed Alarms screen, type: ASA [ENTER]

To unsuppress an active alarm:
- Cursor to alarm tag and type: E

<table>
<thead>
<tr>
<th>Occur</th>
<th>Source</th>
<th>Description</th>
<th>Summ</th>
</tr>
</thead>
</table>
Enabling and Disabling Alarm Areas

The Area Name Configuration screen combines plant operations into alarm areas. The areas allow you to enable or disable alarm annunciation from these plant areas. For example, if you are not using the equipment for an area in your process, you can disable all alarms from these equipment units as a group. ControlBlock tags on group displays and graphic displays are backlighted in grey to indicate that alarms for that block are disabled.

To enable or disable alarm areas:
- Press [OPTION] [ENTER].

The area name annunciates alarm conditions.

To call up Active System Status screen, type:
ANC [ENTER]

Number of alarms in area.

To access other screens:
- [PAGE AHEAD] and [PAGE BACK] to call up other alarm areas.
- [SELECT] on an Area Name entry to see the area alarm list.
- [SELECT] on a Graphic entry to see the process graphic.
- [SELECT] on Unit Ranges field heading to see Plant Unit Configuration.

Enabling and Disabling Alarm Areas

RS3: Operator’s Guide

Alarms
## Alarm Lists

The following table shows the alarm lists for the RS3 and the commands to call up the lists. You can use the [PAGE AHEAD] and [PAGE BACK] keys to move from one list to the next and through the different pages of each list.

### Alarm Lists and Callup Commands

<table>
<thead>
<tr>
<th>Alarm List</th>
<th>Callup Commands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Hardware Alarms</td>
<td>HA [ENTER]</td>
</tr>
<tr>
<td>Cleared Hardware Alarms</td>
<td>HC [ENTER]</td>
</tr>
<tr>
<td>Active Process Alarms</td>
<td>PA [ENTER]</td>
</tr>
<tr>
<td>Cleared Process Alarms</td>
<td>PC [ENTER]</td>
</tr>
<tr>
<td>Critical Active Alarms</td>
<td>CRAA [ENTER]</td>
</tr>
<tr>
<td>Critical Cleared Alarms</td>
<td>CRCA [ENTER]</td>
</tr>
<tr>
<td>Advisory Active Alarms</td>
<td>ADAA [ENTER]</td>
</tr>
<tr>
<td>Advisory Cleared Alarms</td>
<td>ADCA [ENTER]</td>
</tr>
<tr>
<td>Active Batch Alarms</td>
<td>BAAA [ENTER]</td>
</tr>
<tr>
<td>Cleared Batch Alarms</td>
<td>BACA [ENTER]</td>
</tr>
<tr>
<td>Active System Status</td>
<td>SSA [ENTER]</td>
</tr>
<tr>
<td>Cleared System Status</td>
<td>SSC [ENTER]</td>
</tr>
<tr>
<td>Active Suppressed Alarms</td>
<td>ASA [ENTER]</td>
</tr>
<tr>
<td>Cleared Suppressed Alarms</td>
<td>ASC [ENTER]</td>
</tr>
<tr>
<td>Plant Area (ACTV) area name</td>
<td>AAA (area) [ENTER]</td>
</tr>
<tr>
<td>Plant Area (CLRD) area name</td>
<td>CAA (area) [ENTER]</td>
</tr>
<tr>
<td>Disk Event List</td>
<td>DEL [ENTER]</td>
</tr>
<tr>
<td>Event List No. #</td>
<td>EL: (list #) [ENTER]</td>
</tr>
<tr>
<td>Operator Change Log</td>
<td>OL [ENTER]</td>
</tr>
</tbody>
</table>
Locating a Process Alarm Using the Process Alarm List

The process alarm list contains records of alarms issued by controllers. Each alarm is placed in the alarm list as it occurs. There are two kinds of process alarm lists:

Active Process Alarms List - Contains process alarms that are currently in an alarm condition.

Cleared Process Alarms List - Contains process alarms that have been cleared—that is, the alarm condition no longer exists.

To call up the Active Process Alarms list:
- Press [PROCESS ALARM].

<table>
<thead>
<tr>
<th>Occur</th>
<th>Source</th>
<th>Description</th>
<th>Ack</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:12:09</td>
<td>LIC-201/PV</td>
<td>High Advisory 11 Ft.</td>
<td>12:12</td>
</tr>
<tr>
<td>12:08:54</td>
<td>PIC-201/PV</td>
<td>Low Critical 13 PSIG</td>
<td>12:11:22</td>
</tr>
</tbody>
</table>

To call up the Cleared Process Alarms list:
- Press [PAGE AHEAD]. The [PAGE AHEAD] key scrolls the screen to the Cleared Process Alarm list.

<table>
<thead>
<tr>
<th>Occur</th>
<th>Source</th>
<th>Description</th>
<th>Ack</th>
<th>Clear</th>
</tr>
</thead>
</table>

Active Process Alarms and Cleared Process Alarms
To locate the source of an alarm using the Process Alarms list:

1. Press [PROCESS ALARM].

2. Cursor to the alarm. The alarm becomes backlighted.

3. Press [SELECT]. The group display that contains the controller in alarm appears. The controller in alarm is backlighted.

### ACTIVE PROCESS ALARMS 4-Jul-92 12:25:38

<table>
<thead>
<tr>
<th>Occur</th>
<th>Source</th>
<th>Description</th>
<th>Ack</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:12:09</td>
<td>LIC-201/PV</td>
<td>High Advisory 11 Ft.</td>
<td>12:12</td>
</tr>
<tr>
<td>12:08:54</td>
<td>PIC-201/PV</td>
<td>Low Critical 13 PSIG</td>
<td>12:11:22</td>
</tr>
</tbody>
</table>

### 12: Boiler Controls

<table>
<thead>
<tr>
<th>PERCNT</th>
<th>VALVE OPER</th>
<th>PUMP OPER</th>
<th>MASTER OPER</th>
<th>REACT 1</th>
<th>REACT 2</th>
<th>LEVEL INCHES</th>
<th>FEED GPM</th>
<th>LEVEL</th>
<th>FEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.96</td>
<td>OPEN</td>
<td>906</td>
<td>60.00</td>
<td>60.12</td>
<td>60.00</td>
<td>6.4</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.00</td>
<td>CLOSE</td>
<td>1200</td>
<td>80.00</td>
<td>80.00</td>
<td>80.00</td>
<td>8.5</td>
<td>250</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Locating the Source of a Process Alarm
Responding to Hardware Alarms

Hardware alarms indicate a problem with the RS3 hardware. The hardware alarm banner appears at the bottom of the screen. Magenta is the default color for hardware alarms. Hardware alarms have several causes:

- Faults that require immediate attention.
- Faults that might pose problems if ignored or that occur in conjunction with some other fault.
- Configuration changes or maintenance and troubleshooting activities in progress, such as board replacement or calibration.
- Signal transient communications errors. These alarms usually clear by themselves within a few seconds.

Specific operator procedures for hardware alarms should be developed by your site. If you do not recognize an alarm or know the correct response procedure, you should note the hardware alarm and notify the proper personnel.

**NOTE:** The complete list of hardware alarms is included in the *Alarm Messages* Manual.

<table>
<thead>
<tr>
<th>Time of alarm</th>
<th>Control File Address</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:23:18</td>
<td>=1</td>
<td>Redundant CP Failed</td>
</tr>
</tbody>
</table>
Responding to System Status Messages

System status messages indicate a change in system operating condition, such as a trending disabled or console restarted condition. System status messages do not represent an alarm condition. You can usually acknowledge the alarm message and take no further action. However, individual installations may have site-specific alarm response procedures.

Responding to Disk Events

Disk events indicate events that involve the console disk and tape storage devices. You can acknowledge the event message and take no further action. Individual installations may have site-specific alarm response procedure.
Section 7: MTCC with Enhanced Keyboard

MTCC Enhanced Keyboard ........................................ 7-2
Using the Enhanced Keyboard ................................. 7-9
Scrolling Menus ...................................................... 7-10
Changing the Setpoint ............................................. 7-11
Changing the Output ............................................... 7-14
Calling Up Graphic Displays ................................. 7-16
Selecting the Faceplate Mode ............................... 7-18
Menus ................................................................. 7-19
MTCC Enhanced Keyboard

The MTCC enhanced keyboard combines IBM-ASCII keyboard design with RS3™ keyboard functions. Commands are executed from the keyboard using function keys (F1 through F12), dedicated keys, or RS3 commands from the monitor command line. Commands call up screens or perform procedures. The commands are grouped into logical task groups so that most commands can be performed with just 12 function keys that work with a new hierarchical set of menus.

Dedicated keys for alarm response, control loop operations, and scrolling are located in function keypads on the right side of the keyboard. These buttons are labeled on the keyboard according to their function.

The following pages illustrate the enhanced keyboard design and describe the function of its keys.
MTCC Enhanced Keyboard Layout
**Print Screen.** Prints a hard copy of the current screen.

**CRT.** This keyboard function is not available on single CRT MTCC systems.

**Menu.** Calls up a pop-up window that displays a menu of commands. The menu last used remains in effect until an option is selected from a different menu.

### Print, CRT, and Menu Keys on the MTCC Enhanced Keyboard
### Movement Keys on the MTCC Enhanced Keyboard

**Page Up.** Moves to the next page of a screen.

**Home.** Moves the cursor to the upper-left corner of the screen. If the cursor is already in the home position, the Home key can call up a user-defined menu.

**Recall.** Recalls the previously displayed screen.

**Call.** Displays a "Callup" field in the command line for calling up configured callup button displays. Enter a number corresponding to a configured callup button in the command line field.

**Exch.** Exchanges displays. For example:
- Between screens, such as the Discrete Faceplate screen and Continuous Faceplate screen.
- Between configuration mode and viewing mode on a Process Graphic screen.
- Between menu positions in the upper-right and lower-left corners of the screen.

**Page Down.** Moves to the previous page of a screen.
**SIL.** Silences the alarm horn.

**Active.** Calls up the source of the highest priority active alarm.

**ACK.** Acknowledges and clears alarm messages from the screen.

**Alarm.** Toggles between two alarm options on the bottom line of the screen:

- **Alarm Summary** of the number of alarms issued for all alarm types. For example:
  
  | Crit 6/417 | Adv 5/*** | Batch 0/0 | Hard 0/0 | Sys 1/16 |

- **Alarm Banner** for the highest priority unacknowledged alarm. For example:
  
  13:55:42 =7D-72/A High Crit 86.34

---

**Alarm Keys on the MTCC Enhanced Keyboard**
**ON**. Turns on a discrete input (when on, bit value is 1).

**OFF**. Turns off a discrete input (when off, bit value is 0).

**State**. Toggles between the “on” and “off” states of a discrete value.

**Mode, State, Setpoint Keys on the MTCC Enhanced Keyboard**
**Mode, Insert, and Delete Keys on the MTCC Enhanced Keyboard**

- **COMP.** Puts controller block into Supervisory mode. **Local.** Puts the controller block into Local mode. Hold down [ALT] and press [COMP/Local] to select Local mode.

- **OUT.** Allows you to change the output of a ControlBlock. You can change the output by slewing or entering an output value at the top of the block faceplate.

- **MAN.** Puts a ControlBlock into Manual mode.

- **Ins.** Toggles batch script editor between insert mode and replacement mode.

- **Del.** Deletes the last character entered.
Using the Enhanced Keyboard

The following procedures describe how to use the MTCC enhanced keyboard to perform standard console operations:

- Scrolling menus
- Changing setpoint
- Changing output
- Calling up graphic displays
- Selecting faceplate mode
Scrolling Menus

You can use the four arrow keys in the lower-right function pad to move the cursor or scroll menus. When you press [MENU], the arrows scroll menus.

- To scroll screen menus:
  1. Press the [Menu] key to change the function of the arrow keys from cursor control to menu scrolling.
  2. Press left or down key to scroll to the previous menu; press the right or up key to scroll to the next menu.
  3. To discontinue scrolling and resume cursor control, press any key or move the trackball.

Menu Scrolling
Changing the Setpoint

The setpoint value is indicated by the position of the setpoint bar and the setpoint numerical value. You can control the setpoint from the continuous faceplate by:

- Pressing and holding the slewing keys on the console.

  or

- Pressing the setpoint change key and entering the setpoint at the top of the faceplate.

The ControlBlock must be in the Auto mode. The setpoint change results in an immediate output adjustment and a resulting variable change.
Changing Setpoint with the Slewing Keys

To change the setpoint:

1. Press [LSP/B].
2. Press and hold the slewing keys. The setpoint bar and value will change.
Changing Setpoint by Directly Entering a Value

To change the setpoint by directly entering a value:

1. Press [LSP/B].
2. Enter the new setpoint at the top of the faceplate.
Changing the Output

The output value is indicated by the position of the output bar and the output numerical value. You can control the output from a continuous faceplate by:

- Pressing and holding the slewing keys on the console.

or

- Pressing the output change key and entering the output at the top of the faceplate from the numeric keypad.

The controller must be in Manual or Local mode.

To change the output:

1. Press [OUT].
2. Press and hold the slewing keys.

The output bar and value will change.

Changing Output with the Slewing Keys
Changing Output by Directly Entering a Value

To change the output by directly entering a value:
1. Press [OUT].
2. Enter the new setpoint at the top of the faceplate.
Calling Up Graphic Displays

The [Call] key lets you call up user-defined sets of commands or graphic displays. Each command option is identified by a unique index number corresponding to a callup button on the Options keyboard. However, it is not necessary to have an Options keyboard to use this feature. Pressing [Call] displays a “Call Up Button:” field in the command line in which you enter the number of a callup button.

The MTCC provides interface for 96 callup buttons. Numbers entered in the “Call Up Button:” field correspond to the buttons on the three panels of the Options keyboard:

- Panel 1  Callup buttons 1 to 32
- Panel 2  Callup buttons 33 to 64
- Panel 3  Callup buttons 65 to 96
To view a callup button display:

1. Press [Call]. The following command appears on the command line:
   Call Up Button:
2. Type the number of a configured callup button and press [ENTER].

Viewing Callup Button Displays
Selecting the Faceplate Mode

Controllers operate in one of several user-selectable modes. You can change the modes by pressing mode selection keys on the key function pad on the right side of the keyboard.

- To select Auto mode:
  - Press [AUTO].

- To select Remote mode:
  - Press [REM].

- To select Computer mode:
  - Press [COMP/Local].

- To select Local mode:
  1. Hold down [ALT].
  2. Press [COMP/Local].

- To select Manual mode:
  - Press [MAN].

Mode Selection Keys


**Menus**

The MTCC software can be configured to provide menus of the major RS3 commands, organized into logical task groups. The menus appear in pop-up windows. Each command task group is represented by a single menu called a submenu. For example, the Batch submenu contains batch commands, the Configuration submenu contains configuration commands, etc. The Main Menu lists the available submenus.

Menu options are selected with keyboard function keys (F1 through F12) in the top row of the keyboard. Each menu lists:

- The name of the menu
- Function keys used by the menu
- Descriptions of the commands associated with each function key

When you press a function key, the menu will disappear from the screen, but the function keys will continue to execute the commands of that menu until you display another menu and select one of its commands.

**To call up and use menus:**

1. Press the [Menu] key. The menu last used will appear in a pop-up window.

2. Press [Menu] again to call up the Main Menu. The Main Menu lists submenus and function keys for calling up the submenus.

3. Press a function key for a submenu. A pop-up window containing the submenu appears. The submenus list task-related commands and function keys for executing submenu commands.

4. To execute a command, press the function key indicated by the submenu.
To call up and use menus:

1. Press [Menu] to call up last menu used.

2. Press [Menu] again to call up Main Menu.

3. Press a function key to call up a submenu.

4. Press a function key to execute a command.

Using Menus
Console Menus (continued)
Appendix A: Responding to System Faults

This appendix describes how to respond to console faults and how to recover from a power failure.

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Returning a Controller Processor to Normal Mode ... A-8
Checking the Block Status ................................. A-10
Faults Affecting Consoles

On rare occasions, faults can affect console operation. For example, the screen could display incoherent information or the keyboard might not enter commands correctly. Occasionally, the console might not do anything at all. If the time displayed in the upper-right corner of the screen does not change, the console has become inactive.

If these or similar things happen to the console, the following steps can be taken. These are recommendations only. Individual installations may have site-specific fault recovery procedures.

1. Power down the console, wait 15 seconds, and power up the console. When the console has finished powering up, the system menu appears. Power up should only take a few minutes.

   **NOTE:** The Disk Shutdown (DS) command should always be performed before powering down the console. This will purge the cache and prevent possible loss of data.

2. If the problem has not been corrected, call maintenance personnel.
Trackball Failure

If the trackball fails, the configuration keyboard can be used to move the cursor. The illustration below shows the keys that can be used to move the cursor in each direction.

To move the cursor with the configuration keyboard:
- Press and hold [CONTROL] and then press the letter keys as desired.

Configuration Keyboard Cursor Movement Keys

K

H  L

J

Configuration Keyboard Cursor Movement Keys
Recovery from Power Failure

If power to the RS3 fails, a battery backup keeps the ControlFile and the controllers running. However, if power is out long enough to deplete the battery backup, all controllers and the entire ControlFile will power down. The plant configuration is saved under these conditions.

**NOTE:** The procedures described in this section are guidelines only. Individual installations may have site-specific power failure recovery procedures.

Startup After Power Failure

When power is restored, the console restarts automatically. The console first performs diagnostics on itself. The results are displayed on the power up diagnostics screen, as shown on the next page. Each diagnostic test is displayed as “PASSED” or “FAILED” as it is completed. If a test fails, the console may not start up successfully.

**NOTE:** If any diagnostics test displays “FAILED”, write down the name of the test and any information that is backlit. Then press [ALARM ACK] to continue the diagnostics.

If the console startup is successful, the system menu appears on the console in a few minutes. If the startup is not successful, call maintenance personnel.
Powerup Diagnostics Screen
Resuming Normal Control

When the console is restarted, most console displays remain as they were before the power failure. However, Controller Processors in the ControlFile will be in Standby mode. As shown below, controllers within Controller Processors in Standby mode continue to function but do not send output to the field. As shown on the next page, when the Controller Processor is in Standby mode, the faceplate modes of the controllers within are backlit and flashing.

CAUTION

When the Controller Processor is returned to Normal mode, the controllers will begin sending output to the field. The operator should determine, for each controller, if any adjustments or mode changes are needed before returning the Controller Processor to Normal mode.

Controller Processor in Standby Mode
When the Controller Processor that contains the controllers is in Standby mode...

The controller modes are backlit and flashing.

Controller Modes When Controller Processor is in Standby Mode
Returning a Controller Processor to Normal Mode

To return a Controller Processor to Normal mode:

1. Call up the Control File Status screen in one of the following ways:
   - Type CFS [ENTER] on any configuration keyboard.
   - Press a callup button that is configured to call up the screen.
2. Cursor to the “Status” field of the desired Controller Processor.
3. Press [ENTER] to change the mode.
### Responding to System Faults

1. Call up the Control File Status screen.

2. Cursor to the Controller Processor Status field.

3. Press [ENTER].

<table>
<thead>
<tr>
<th>Card Type</th>
<th>Boot Rev</th>
<th>Idle Time</th>
<th>Free Space</th>
<th>Avail Links</th>
<th>Scan Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>5.16</td>
<td>92. %</td>
<td>88. %</td>
<td>36</td>
<td>.5 S</td>
</tr>
<tr>
<td>MLC</td>
<td>5.16</td>
<td>92. %</td>
<td>90. %</td>
<td>36</td>
<td>.5 S</td>
</tr>
<tr>
<td>MPC</td>
<td>5.16</td>
<td>100 %</td>
<td>94. %</td>
<td>38</td>
<td>.5 S</td>
</tr>
<tr>
<td>MPC</td>
<td>5.16</td>
<td>99. %</td>
<td>95. %</td>
<td>38</td>
<td>.5 S</td>
</tr>
</tbody>
</table>

Node Address >2  
File Status >Stdby

Left Cord Proc: Boot 2.33 Prsm 7.06 Avail Links 40 Idle Time 62.%
Right Cord Proc:
Left Bubble Memory: Controller Prsm 7.08 Free Space 42.%
Checking the Block Status

The Block Status screen displays information about the configured I/O blocks and ControlBlocks that are in modes other than Auto or that are in alarm. This screen is for display only; you cannot make entries from it.

To call up the Block Status screens, type:

CBS [ENTER]

The Block Status screen is displayed for card cage A. Use [PAGE AHEAD] to move to the Block Status screen for the next card cage. Press [EXCH] to call up the Block Directory for the Controller Processor.

Below is a sample Block Status screen for Controller Processor =3C. The following table describes the types of information provided in the screen areas.

To call up a controller faceplate screen:
- Cursor to the tag or address of the desired block and press [SELECT].

<table>
<thead>
<tr>
<th>Block Tag</th>
<th>Type</th>
<th>Mode</th>
<th>Alarm</th>
<th>Steps</th>
<th>Plant</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>=3C-06 MANSET</td>
<td>DISC</td>
<td>OPERATOR</td>
<td></td>
<td>2</td>
<td>131</td>
<td>31</td>
</tr>
<tr>
<td>=3C-43 Valve-1</td>
<td>DISC</td>
<td>AUTO ALARM</td>
<td></td>
<td>2</td>
<td>210</td>
<td>65</td>
</tr>
<tr>
<td>=3C-44 Valve-1</td>
<td>DISC</td>
<td>OPERATOR</td>
<td></td>
<td>2</td>
<td>109</td>
<td>119</td>
</tr>
<tr>
<td>=3C-97 VCC-1</td>
<td>PID</td>
<td>MANUAL</td>
<td>b</td>
<td>2</td>
<td>262</td>
<td>55</td>
</tr>
<tr>
<td>=3C-98 VCC-1</td>
<td>PID</td>
<td>MANUAL</td>
<td></td>
<td>2</td>
<td>191</td>
<td>75</td>
</tr>
<tr>
<td>=3C-99 VCC-1</td>
<td>PID</td>
<td>MANUAL</td>
<td></td>
<td>2</td>
<td>241</td>
<td>50</td>
</tr>
</tbody>
</table>

*END*
### Block Status Screen Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block</td>
<td>Address of the block.</td>
</tr>
<tr>
<td>Tag</td>
<td>User-defined block tag.</td>
</tr>
<tr>
<td>Type</td>
<td>Type of block. For ControlBlocks, identifies the ControlBlock function.</td>
</tr>
<tr>
<td>Mode</td>
<td>Current block mode.</td>
</tr>
<tr>
<td>Alarm</td>
<td>Indicates whether the block is currently in alarm. Not all block alarms trigger an indication.</td>
</tr>
<tr>
<td>Steps in Manual</td>
<td>For ControlBlocks only, displays any steps that are currently in manual mode.</td>
</tr>
<tr>
<td>Plant Unit</td>
<td>User-defined group to which the block is assigned.</td>
</tr>
<tr>
<td>Size</td>
<td>Amount of static and dynamic space used by the block and the total amount of space the block uses. This information is displayed for a configuror only.</td>
</tr>
</tbody>
</table>
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