JNIOR Series 3

A Network I/O Resource
Utilizing the JAVA™ Platform

Command Line Communications Manual

Release 1.0

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1 INTRODUCTION

1.1 About This Manual

This manual is intended to provide an overview of the command line communications methods available to the user for monitoring, controlling and configuring your new **JNIOR**. This manual also assumes that the **JNIOR** has been properly configured and is communicating with your network or computer for both the serial and Ethernet communications. Additional information on how to properly configure and set up communications with your new **JNIOR** is provided in separate documents located on the **JNIOR Product CD** that has been supplied with your new **JNIOR**.

1.2 Communications Options

There are 2 options available to the user for configuring and monitoring the **JNIOR** from a command line. If the **JNIOR** is currently connected to your network, you can use a telnet connection and the appropriate IP Address to perform all available commands. If you don't have your **JNIOR** set up on the network, you can use HyperTerminal and a serial connection. For complete instructions on how to establish communications using either of these methods, see the **Getting Started Manual** available on the **JNIOR Product CD** supplied to you with your new **JNIOR**.

2 WHAT CAN I DO FROM THE COMMAND LINE?

2.1 Available Commands

After you have logged in with your user name and password, the **JNIOR** System Services has several commands that may be executed from the command line. To display a list of commands enter the **help** command at the command prompt. To display usage of a particular command use the **help** command prior to the command on the command line. For example **help date**, displays usage of the date command.

The following commands are available, but only the more frequently used ones are described in this section. Please see below for a complete explanation of each of these available commands.

```
Available Commands:

  addc            arp             cat             cd
  chmod           chown           copy            cp
  date            del             dir             downserver
  echo            extern          ftp             gc
  get             help            history         hostname
  ipconfig        java            jrconfig        jrflash
  jrmon           kill            ls              md
  mkdir           move            mv              netstat
  nslookup        passwd          ping            ps
  pwd             rd              reboot          registry
  rm              rmdir           sendmail        set
  setenv          startserver     stats           stopserver
  su              useradd         userdel         who
  whoami
```

*NOTE: It is your responsibility to use System Service commands in an appropriate way such that they do not affect the operation or set-up of the **JNIOR**. If you are not familiar with some of the commands, then it is recommended that you do not use those commands. INTEG is not responsible for errant use of these commands.*

addc

This command adds a dynamically loaded command to slush.

Syntax:

addc CLASSNAME[alias]

Example:

/> **addc**

arp

This command dumps all ARP cache entries.

Syntax:
arp

Example:
/> **arp**

cat

This command is a **JNIOR** file system command that is used to display the contents of a file.

Syntax:
cat FILE

Example:
/> **cat** jniorboot.log ‘displays the contents of the boot log file

cd

This command is a **JNIOR** file system command that is used to change the current working directory.

Syntax:
cd DIR

Example:
/> **cd** www ‘changes the working directory down one level to www
/> **cd..** ‘changes the working directory up one level

chmod

This command is a **JNIOR** system services command that is used to change the permissions of the specified file.

Syntax:
chmod [options] FILE

Example:
/> **chmod** FILE

chown

This command is a **JNIOR** system services command that is used to change the owner of the specified FILE to USER.

Syntax:
chown USER FILE

Example:
/> **chown** jnior FILE

copy

This command is a **JNIOR** file system command that is used to copy files from SRC to DEST.

Syntax:
copy SRC DEST

Example:
/> **copy** SRC DEST

cp

This command is a **JNIOR** file system command that is used to copy files from SRC to DEST. This command is the same as the **copy** command described above.

Syntax:
cp SRC DEST

Example:
/> **cp** SRC DEST

date

This command is a **JNIOR** system services command that is used to display the current system date.

Syntax: u
date [option] [mmddyyyyhhmmss] [timezone]

Example:
/> **date**

del

This command is a **JNIOR** system services command that is used to delete the specified file.

Syntax: u
del FILE

Example:
/> **del** FILE

dir

This command is a **JNIOR** file system command that is used to display a list of the files in the working directory (same as **ls** command).

Syntax:
dir

Example:
/> **dir**

downserver

This command is a **JNIOR** system services command that is used to shutdown a desired server

Syntax:
stopserver [options]

Shuts down the specified server.
[-s] Serial Server
[-d] Disable console output. Used only with '-s'.
[-t] Telnet Server
[-f] FTP Server
[-x] Service Server
Alias: downserver

ftp

This command is a **JNIOR** system services command that is used to shutdown a desired server

Syntax:
ftp [option] [SERVER]
Where options include:
[-d] Enable debug output
[-s FILE] Use FTP script file FILE
SERVER should be the full name of the ftp server to connect to**gc**

help

This command is a **JNIOR** system services command that is used display all available commands

history

This command is a **JNIOR** system services command that is used to show the user the last 5 commands used

hostname

This command is a **JNIOR** system services command that is used to change the hostname of the JNIOR

hostname NAME

Displays or sets the system hostname and domain name.
'hostname tini1.dalsemi.com' sets the hostname and the domain name.
'hostname tini1' sets only the hostname.

ipconfig

This command is a **JNIOR** system services command that is used to display or configure your **JNIOR** network settings. You must be logged in as an Admin user to take advantage of this command.

Syntax:

ipconfig -a IP **-m** MASK **-g** GATEWAY **-p** PRINAME **-s** SECNAME **-h** MAILHOST

where:

IP	= desired IP address
MASK	= IP mask
GATEWAY	= gateway address
PRINAME	= ip address of the Primary Name Server
SECNAME	= ip address of the Secondary Name Server
MAILHOST	= ip address of the Mail host Name Server

Example:

/> **ipconfig -a** 169.144.25.10 **-m** 255.255.255.0 **-g** 169.144.25.1 **-p** 169.144.25.1 **-h** 169.144.25.3

java

This command is a **JNIOR** system services command that is used to execute the given Java class.

Syntax:

java [options] FILE [&]

Example:

/> **java**

jrconfig

This command is a **JNIOR** system services command that is used to display or configure the **JNIOR** settings. You must be logged in as an Admin user to take advantage of this command.

Syntax:

jrconfig [-z TCPport]	Set JNIOR TCP/IP port number
jrconfig [-f]	Remove Field Firmware Update
jrconfig [-d]	Restore the factory settings
jrconfig [-r]	Restore factory settings and remove the Field Firmware Update

Example:

/> **jrconfig -z** 9200

jrflash

This command is a **JNIOR** system services command that is used to manage flash file system.

Syntax:

jrflash [options]

Example:

/> **jrflash**

jrmon

This command is a **JNIOR** system services command that is used to monitor or control active **JNIOR** I/O.

Syntax:

jrmon [options]

Example:

/> **jrmon**	‘monitor the I/O
/> **jrmon -c**	‘change the outputs with specified change commands

kill

This command is a **JNIOR** system services command that is used to kill the specified process.

Syntax:

kill PROCESS_ID

Example:

/> **kill** PROCESS_ID

ls

ls - display a list of the files in the working directory (same as **dir** command)

Ex: /> **ls**

md

This command is a **JNIOR** system services command that is used to create the specified directory.

Syntax:
md DIR

Example:
/> **md** www ‘creates the directory “www”

mkdir

This command is a **JNIOR** system services command that is used to make the specified directory.

Syntax:
mkdir DIR

Example:
/> **mkdir** www ‘makes the directory “www”

move

This command is a **JNIOR** file system command that is used to move the file from SRC to DEST.

Syntax:
move SRC DEST

Example:
/> **move** SRC DEST

mv

This command is a **JNIOR** file system command that is used to move the file from SRC to DEST (same as move).

Syntax:
mv SRC DEST

Example:
/> **mv** SRC DEST

netstat

This command is a **JNIOR** system services command that is used to list all TCP connections.

Syntax:
netstat

Example:
/> **netstat**

nslookup

This command is a **JNIOR** system services command that is used to display the host name or IP address, whichever is not provided.

Syntax:
nslookup [NAME | IP]

Example:
/> **nslookup**

passwd

This command is a **JNIOR** system services command that is used to set the password for the specified user. You will be prompted for the new password and will be prompted again to confirm the password change. The password must be entered in twice exactly the same otherwise the change will not take effect. Note that the password will not be displayed as you type. Passwords are case-sensitive. You must be logged in as an Admin user to take advantage of this command.

Syntax:
passwd *password*

Example:
/> **passwd** jnior
Enter in the new password: new password
Confirm the new password: new password

ping

This command is a **JNIOR** system services command that is used to send echo requests to network hosts.

Syntax:
ping HOST

Example:
/> **ping** HOST

ps

This command is a **JNIOR** system services command that is used to list the currently running processes.

Syntax:
ps

Example:
/> **ps**

rd

This command is a **JNIOR** system services command that is used to remove the specified directory.

Syntax:
rd DIR

Example:
/> **rd** www ‘removes the directory “www”

reboot

This command is a **JNIOR** system services command that is used to shut down all servers and reboot the system.

Syntax:
reboot [option]

Example:
/> **reboot**

registry

This command is a **JNIOR** system services command that is used to start the Registry Editor. You must be logged in as an Admin user to take advantage of this command.

Syntax:
registry

Example:
/> **registry**

rm

This command is a **JNIOR** system services command that is used to delete the specified file (same as del command).

Syntax:

rm FILE

Example:

/> **rm** FILE

rmdir

This command is a **JNIOR** system services command that is used to remove the specified directory.

Syntax:

rmdir DIR

Example:

/> **rmdir** www removes the directory “www”

sendmail

This command is a **JNIOR** system services command that is used to send email to the designated recipients (separated by commas).

Syntax:

sendmail [-f fromaddr] [recipients] [cc’s]

Example:

/> **sendmail** [-f fromaddr] [recipients] [cc’s]

setenv

This command is a **JNIOR** system services command that is used to set the variable to the value in the current environment.

Syntax:

setenv [VAR VAL]

Example:

/> **setenv** [VAR VAL]

startserver

This command is a **JNIOR** system services command that is used to start up the specified server.

Syntax:
startserver [options]

Example:
/> **startserver**

stats

This command is a **JNIOR** system services command that is used to display current system status information.

Syntax:
stats [-v]

Example:
/> **stats**

stopserver

This command is a **JNIOR** system services command that is used to stop the specified server.

Syntax:
stopserver [options]

Example:
/> **stopserver**

su

This command is a **JNIOR** system services command that is used to switch the current user. Default is root.

Syntax:
su [USER]

Example:
/> **su** jnior

useradd

This command is a **JNIOR** system services command that is used to add a user to the current **JNIOR**. You must be logged in as an Admin user to take advantage of this command.

Syntax: u
useradd -n *username* **-p** *password* **-i** *user ID number*

Example:
/> **useradd -n** jnior **-p** jnior **-i** 128

userdel

This command is a **JNIOR** system services command that is used to delete a user from the current **JNIOR**. You must be logged in as an Admin user to take advantage of this command.

Syntax:
userdel *username*

Example:
/> **userdel** jnior

who

This command is a **JNIOR** system services command that is used to display all users on the system.

Syntax:
who

Example:
/> **who**

whoami

This command is a **JNIOR** system services command that is used to display the current user's User ID.

Syntax:
whoami

Example:
/> **whoami**

2.1.1 File System

The **JNIOR** contains a file system in memory that can be accessed from the command line by using some of the commands described in the previous section (e.g. **dir**, **cd**, **cat**, etc). You do NOT need to access any specific files to utilize or configure the **JNIOR**.

However, there are a few files that may be of relevant to your needs as provided in the following table.

File Name	Directory Location	Description
jniorboot.log	(root)	Log of system events during boot up
jniorsys.log	(root)	Log of all systems events
jnior.ini	/flash	JNIOR configuration initialization
passwd	/etc	List of usernames, encrypted passwords, and user ids
*	/www	Various html and applet files

2.1.2 System Services Commands

System Services are those features and functions accessible when you log into the **JNIOR** at the operating system level. In order to do this, you must connect to the **JNIOR** via Telnet (using the Ethernet connection) or HyperTerminal (using the RS232 connection). Both of these connection methods were described in Section 3 - Setting Up JNIOR Communications, in relation to configuring the IP settings for your **JNIOR**.

If you have already configured your IP address correctly using the RS232 connection, then it is easiest to use a Telnet session to connect to your **JNIOR** over the Ethernet connection. This is especially important if your **JNIOR** is in a remote location and cannot be easily connected to with an RS232 serial cable. For ease of reading, this section assumes you will connect with a Telnet session however connecting with HyperTerminal is also acceptable.

After connecting to the **JNIOR** via Telnet, you must enter your admin privilege level <username> and <password> provided with your **JNIOR** (or subsequently configured). Note that certain system service commands and operations are permitted for admin privilege level users only.

Some of the most frequently used commands were described in Section 4.2.1, Command Line Communication. The following table is a complete list of the available system service commands.

Command	Format with Parameters	Description
addc	/> addc CLASSNAME [alias]	Adds a dynamically loaded command to slush
arp	/> arp	Dumps all ARP cache entries
cat	/> cat FILE	Displays the contents of the specified file
cd	/> cd DIR /> cd ..	Changes the current working directory
chmod	/> chmod [options] FILE	Changes the permissions of the specified file
chown	/> chown USER FILE	Changes the owner of the specified to USER
copy	/> copy SRC DEST	Copy SRC to DEST

cp	/> cp SRC DEST	Same as copy command
date	/> date [option] [mmddyyyyhhmmss] [timezone]	
del	/> del FILE	Deletes the specified file
dir	/> dir [option] FILE	Lists the files in the current directory
downserver	/> downserver [options]	Shuts down the specified server. Same as stopserver command
echo	/> echo TEXT	Echos the text to the screen
ftp	/> ftp option] [SERVER]	Enables a File Transfer Protocol session to a specified server
gc	/> gc	Runs the garbage collector
genlog	/> genlog [option]	Toggles system log generation on boot
history	/> history	Displays a history list of previously commands
hostname	/> hostname [HOST.DOMAIN.com]	Displays or sets the system hostname and domain name
Ipconfig	/> ipconfig [options]	Display or configure the network setting
java	/> java [options] FILE [&]	Executes the given Java class
jrconfig	/> jrconfig [options]	Display or configure the JNIOR settings
jrflash	/> jrflash [options]	Manages flash file system
jrmon	/> jrmon [options]	Monitor and/or control JNIOR I/O
kill	/> kill PROCESS_ID	Kill the specified process
ls	/> ls [option] FILE	List the files in the current directory (same as dir command)
md	/> md DIR	Create a new directory
move	/> move SRC DEST	Moves the file from SRC to DEST
mv	/> mv SRC DEST	Moves the file from SRC to DEST (same as move)
netstat	/> netstat	List all TCP connections
nslookup	/> nslookup [NAME | IP]	Displays the host name or IP, whichever is not provided
passwd	/> passwd [USER]	Sets the password for the specified USER or defaults to the current user
ping	/> ping HOST	Sends echo requests to network hosts
ps	/> ps	Lists the currently running processes
pwd	/> pwd	Lists the current working directory
rd	/> rd DIR	Removes the specified directory
reboot	/> reboot [option]	Shuts down all servers and reboots the system

Registry	/> registry	Starts the Registry Editor
rm	/> rm FILE	Deletes the specified file (same as del command)
rmdir	/> rmdir DIR	Removes the specified directory
sendmail	/> sendmail [-f fromaddr] [recipients] [cc's]	Send email to the designated recipients (separated by commas)
setenv	/> setenv {VAR VAL]	Sets the variable to the value in the current environment
startserver	/> startserver [options]	Starts up the specified server
stats	/> stats [-v]	Displays current system status information
stopserver	/> stopserver [options]	Stops the specified server
su	/> su [USER]	Switch user. Default is root
touch	/> touch FILE	Sets the last modified time to the current time
useradd	/> useradd [options]	Adds a user to the system
userdel	/> userdel [user(s)]	Deletes the specified user(s) from the system
who	/> who	Displays all user on the system
whoami	/> whoami	Displays the current user's user id

*NOTE: It is your responsibility to use System Services in an appropriate way such that they do not affect the operation or set-up of the **JNIOR**. If you are not familiar with some of the commands, then it is recommended that you do not use those commands. INTEG is not responsible for errant use of these commands.*

2.2 Setting Up a Port Number

The **JNIOR** comes shipped from the factory configured to communicate over your network using ports 80 and 9200. Port 80 is the standard port for launching web pages and this can be changed in the Registry. Port 9200 is the port that is used by the **JNIOR** for communicating with its Web Pages. This is a port that is typically open and available on a network. However, should this port not be available or should you wish to change your port number, there are two options. You may use the **`jrconfig`** command to immediately alter the port or you may edit the Registry to make the change upon reboot.

Port numbers range from 0 to 65,535 with port numbers 0 – 1023 being restricted and usually reserved for well-known applications such as HTTP and FTP. If you are unsure of which port number to select for the Web Pages, it is recommended that you select a port number of 1024 or greater.

The port number can be set by the **`jrconfig`** command using a Telnet or Serial Terminal session. Type the **`jrconfig -z TCP Port`** command to set the desired port number. For example:

```
TINI /> jrconfig help
jrconfig [options]

Configure or display the JNIOR settings.
 [-z TCP port]       Set JNIOR TCP/IP port number
 [-f]                Remove Field Firmware Update

TINI /> jrconfig -z 9200

Saving settings...
Restarting JNIOR services. This may take a minute.
Please wait...
JNIOR services restarted.

TINI />
```

After you have completed the above procedure, the **JNIOR** will utilize the new port number for JNIOR Protocol data communications.

Note that Modbus communicates over port 502 by default. The **JNIOR** Modbus Protocol Implementation is described in a separate document. The Modbus port may also be changed but only through the Registry Editor. In this case the **JNIOR** must be rebooted to begin utilizing the new port.

3 FREQUENTLY USED COMMANDS

3.1 Administering Usernames and Passwords

3.2 Using the JRMON Command

Description

The **JRMON** command provides for input and output monitoring and control from the Slush command prompt either through Serial0 or Telnet.

Input & Output Monitoring

The JRMON command may be issued from the command line without options. This permits the input and output status to be monitored. This function is available to all JNIOR users who can successfully log into the OS command mode. Any keystroke will exit the program. The following is a typical display:

```
TINI /> jrmon
JNIOR Active I/O Monitor
Copyright(c) 2005 INTEG process group, inc.  All Rights Reserved.

Any key to interrupt.

   8-DINn-1  8-RLYn-1
*  00000000  00000000
```

The last line will dynamically update displaying the current status of the digital inputs and outputs. This ongoing update is indicated by a twirling symbol in place of the '*' above. Any keystroke will terminate the program and return to the prompt.

8-DINn-1

The eight digits below this heading indicate the status of the eight digital inputs 1 thru 8. This is displayed with Digital Input 1 on the right through Digital input 8 at the left. A '0' indicates that the corresponding digital input is inactive or 'Off'. A '1' indicates that the digital input is active or 'On'. A '1' would indicate the presence of a positive voltage between the digital input's '+' and '-' terminals.

During inactivity the status updates only once per second. Updates occur almost instantaneously when input states are actively changing. In this case the twirling symbol may appear to accelerate. The dynamic status of the digital inputs can be successfully monitored with this utility in this mode.

8-RLYn-1

The eight digits below this heading indicate the status of the eight relay outputs 1 thru 8. This is displayed with Relay Output 1 on the right through Relay Output 8 at the left. A ‘0’ indicates that the corresponding relay is inactive or ‘Open’. A ‘1’ indicates that the relay is active or ‘Closed’. A ‘1’ would indicate that the relay will conduct current between its two terminals.

During inactivity the status updates only once per second. Updates occur almost instantaneously when output states are actively changing. In this case the twirling symbol may appear to accelerate. The dynamic status of the relay outputs can be successfully monitored with this utility in this mode without interfering with the applications that may be directly controlling the relays.

Output Control

Using the **-c** option on the command line those logged into the OS command mode as administrators may use JRMON to change the status of the eight relay outputs. This enables a series of service commands. The following is a typical display:

```
TINI /> jrmon -c
JNIOR Active I/O Monitor
Copyright(c) 2005 INTEG process group, inc.  All Rights Reserved.

  [C]lose NNN, [L]ist Counters, [O]pen NNN, [P]ulse
  [Q]uit, [R]eset, [S]et Counters NNN, [U]sage
  NNN - list of 1-8 input/relay selection
  '=' to specify parameter (pulse duration in msec, counts)
  '<' or '>' for command history

   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
*  00000000  00000000  > _
```

As in the Monitoring mode the last line will actively update as indicated by the twirling symbol replacing the ‘*’ above. The command prompt ‘>’ followed by the cursor now appears on the line. Commands may be entered at the cursor while active input and output monitoring proceeds. A brief description of the available commands is displayed in the header dialog. Once a command has been entered after the prompt it can be “executed” as one would expect by hitting the ENTER key. For example:

```
   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
   00000000  00000000  > c1c5[ENTER]
*  00000001  00010001  > _
```

Above we see that the command “c1c5” has been entered with “[ENTER]” indicating the use of the ENTER key. The ENTER key won’t be explicitly shown through the remainder of this document. It is important to note that upon execution of a command JRMON will move to a new line. Only the latest line will dynamically update. The twirling symbol replacing the ‘*’ in the above will reside only on the active line.

Each of the commands will be described shortly. In this example the user instructs JRMON to close relay outputs 1 and 5. The other relays remain unaffected and in the state they were in before the command. Only the “selected” relays are affected. Observe the indicated state changes for relay outputs 1 and 5 under the 8-RLYn-1 heading. In this instance the external wiring around the JNIOR is such that Digital Input 1 responds to the relay changes. Actually here Digital Input 1 indicates the successful closure of Relay Output 1 as that output happens to be wired to the corresponding input for

demonstration. The entire command is executed at once and the two relay changes occur simultaneously.

There are only a few valid commands. The user's entry must conform to the defined syntax. If an error is made or an invalid command entered it is indicated as follows:

```
   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
   00000000  00000000  > c1c5
   00000001  00010001  > huh

** invalid command

   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
*  00000001  00010001  > _
```

Here the entry "huh" constitutes an unknown command and the error is indicated upon use of the ENTER key. JRMON then redisplays the heading along with a new entry line with active monitor.

Command Entry

All JRMON commands are single characters and are case independent. Spaces are ignored and can optionally be used in commands to make them more readable. Multiple commands can follow each other on the same line but do not take effect until the ENTER key is used and the command set is executed.

The digits 1 thru 8 are, with one exception, used to indicate or "select" the relay outputs 1 thru 8. There are rules for their use and they apply to only a couple of the commands (Close, Open and Set). An integer parameter may be specified at the end of a command line following an '=' sign (pulse duration). All of this is described later in this document.

Editing

There are not many features in JRMON supporting the entry and editing of commands. This is to keep the utility functional across a wide variety of access methods from HyperTerminal to Telnet clients on multiple platforms including user developed Telnet compliant applications. The following are the only active editing keys:

ENTER	Executes the current command line or moves to a new monitoring line (snapshot).
BACKSPACE	Removes the character immediately to the left of the cursor (if any).
<	Retrieves a prior command line from the command history (described below).
>	Retrieves a subsequent command line from the command history (described below).

If the user enters a command line and wishes to erase the whole thing and start over the BACKSPACE key can be used repeatedly to achieve that goal. Alternately the ‘<’ key (bringing up a prior command if any) followed by the ‘>’ key may result in an empty line depending on the status of the command history. This may be a shortcut which can be used if you prefer.

Command History

JRMON maintains a record of the last 20 successful commands entered during the current session. The ‘<’ key is used to emulate a back arrow retrieving the prior command from the history. The ‘<’ key can be used repeatedly until that desired command is located or the end of the history is reached. With the desired command displayed the user need only hit ENTER to execute it. This is a convenient way to repeat command and eliminate any tedious reentry. The displayed command can be further edited or appended to prior to use.

The ‘> key serves a similar function retrieving the command subsequent to the one displayed. If you move back in the history and pass the desired command you can use the ‘>’ key to come back to it. The ‘>’ key can be used repeatedly until you return to the present command entry which will present as a blank line.

If you exit JRMON returning to the OS command prompt and later restart JRMON in the same session (without logging out), all of the prior commands may still be available in the history. This is true also for the default pulse duration (described later).

Available Commands

The JRMON command set for the most part is designed to provide flexibility in the control of the relay outputs. Only the referenced (selected) relay outputs in any one command are affected by that command. The remaining relay outputs remain unchanged. Relays may be specifically commanded to Close or Open. This may be a static change or a pulsed change which is applied for a defined duration. Commands are case independent and spaces in command lines are ignored. The various commands are described below:

Q – Quit

The Quit command is used to exit JRMON returning to the OS command prompt. This command may appear on a command line in combination with other commands. JRMON will exit after executing all of the commands. The command line “RQ” for instance will reset all of the relay outputs to the open condition prior to exiting to the OS prompt.

R – Reset

Resets all relay outputs to the open (0) condition.

C – Close NNN…

The Close command indicates that the relay outputs selected by subsequent digits NNN (1 thru 8) are to be closed (1 state) upon execution of the command. The command “C1C5” selects relay outputs 1 and 5 and both will be in the closed state (1) upon execution. The commands “C1C3C5” and “C135” are equivalent. The command “C1Q35” although an odd entry would leave the relay outputs in the

same state with Relay Outputs 1, 3 and 5 closed (1) prior to exit to the OS prompt. The resulting state of the selected relays is determined by reading from left to right (see Open below for more).

O – Open NNN…

The Open command indicates that the relay outputs selected by subsequent digits NNN (1 thru 8) are to be open (0 state) upon execution of the command. The command "O1O5" selects relay outputs 1 and 5 and both will be in the open state (0) upon execution.

All relay output referenced by either the Open of Close commands will be affected by the command. All other relays will remain in an unchanged state. The states of the selected relays are specified from left to right in the command. For instance, the command "C135O1" will result in Relay Outputs 3 and 5 being in the closed state (1) and Relay Output 1 in the open state (0). The Open command to the right overrides the Close at the beginning of the command. The following all have an equivalent effect with the last having the added benefit of exiting to the OS prompt.

```
C135O1
c1c3c5o1
c13o1c5
o1c3c5
O1C35Q
```

The Close and Open commands define new states for the referenced relay outputs which will remain in effect until the execution of subsequent commands. Note that independent applications controlling the JNIOR outputs can simultaneous alter the output states. Commands entered through JRMON may conflict with these applications or may otherwise confuse them. It is recommended that under such conditions JRMON should be used carefully and by qualified personnel familiar with the application.

P – Pulse

Relay outputs on the JNIOR2B can be pulsed with a resolution of 1 millisecond. This can also be achieved using JRMON with the Pulse command. The relay output states specified by any combination of Close and Open commands can be held for the default Duration (count of milliseconds) by including the Pulse command. The current default pulse duration is indicated in the Header. For example, the command "C13O2P" pulses the output state 101 for Relay Outputs 1-3 in the following example for 100 milliseconds.

```
   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
   00000000  00000010  > c13o2p
*  00000000  00000101  > (for 0.100 seconds)
*  00000000  00000010  >
```

In the above the *italicized* line shows the display of the active monitor for the brief 1/10th second of the pulse. The shortest pulse is 1 millisecond and very lengthy pulses of hours can be initiated. The JNIOR can only execute one pulse at any time. Any Pulse command that is entered prior to the completion of an earlier Pulse command will prematurely termination the initial pulse.

Specific pulse durations may be specified within the command lines. In the following example, even though the default pulse duration remains 100 milliseconds, a 5 second pulse is initiated.

```
   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
```

```
   00000000  00000000  > c13p = 5000
*  00000000  00000101  > (for 5.000 seconds)
*  00000000  00000000  >
```

As with the normal Open and Close commands, the Pulse command only affects those selected relay outputs. In the above examples Relay Outputs 4-8 remain in their original state and can be separately commanded to change state without affecting any pulse in progress. Note the difference between the last two examples in regards to the state of Relay Output 2. That output is also unaffected in the second example which selects only Relay Outputs 1 and 3.

The '=' sign allows for the specification of a parameter to the command. It must appear at the end of the command line and be followed only be an unsigned integer parameter correctly specified with valid digits (0-9). Spaces are ignored and no JRMON commands may follow the '=' sign. The command will be invalid if the parameter is not cleanly specified.

Default Pulse Duration

The default pulse duration may be set by a Pulse command that does not select any relay outputs. In the following example the default pulse is changed from 100 milliseconds to 2.500 seconds.

```
   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
   00000000  00000000  > p=2500

   8-DINn-1  8-RLYn-1      Default pulse = 2500 msec
   00000000  00000000  >
```

Since the default pulse duration has been changed, JRMON redisplays the header with the new value. Any subsequent Pulse command entered without specific duration will now be of 2.5 second duration. If the user exits JRMON and returns to the OS prompt, this new default pulse duration will remain upon subsequent use of JRMON provided that the user does not log out. Under certain conditions the default pulse duration may be reset depending on events experienced at the OS prompt. In general it will remain in place as will the 20-line command history from any prior JRMON use.

A Pulse command given without either the relay selection or the default duration parameter is invalid.

L – List Counters

Each Digital Input has a 32-bit counter associated with it. The [L]ist Counters command will display the current values present in those counters. For example:

```
   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
   00000000  00000000  > l

     din1     din2     din3     din4     din5     din6     din7     din8
   106331    49177       35      182        0        0        0        0

   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
*  00000000  00000000  > _
```

In the above example we can see that Digital Input 1 has changed state quite frequently and that the last four inputs have not been used at all.

S – Set Counters

Having individual Digital Input Counters generates the need to be able to reset them to zero (0) or to otherwise initialize them to a known value (perhaps for testing purposes). The Set Counters command allows you to set individual counters. You must specify the counters using the digits 1-8 or the '*' asterisk to indicate all counters. The new counter value must also be specified even if it is zero. The following is the required syntax for resetting all counters:

```
   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
   00000000  00000000  > s*=0

     din1     din2     din3     din4     din5     din6     din7     din8
        0        0        0        0        0        0        0        0

   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
*  00000000  00000000  >
```

If individual counters are to be affected and others left unchanged then the specific counter or counters must be specified. The following initializes two of the counters to 1,000:

```
   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
   00000000  00000000  > s23=1000

     din1     din2     din3     din4     din5     din6     din7     din8
        0     1000     1000        0        0        0        0        0

   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
*  00000000  00000000  >
```

The [S]et Counter command cannot be used in combination with any form of the [P]ulse command. This is to eliminate ambiguity over the use of the parameter following the equals sign. The [S]et command requires the parameter as well as the specification of at least one counter otherwise an invalid command error message results.

U – Usage

The jr310 tallies the amount of time that an individual input is on the "ON" state or that an output relay is in the "CLOSED" state. The timing is valid to the millisecond. JRMON may be used to display these Usage Meters. The output appears as follows:

```
TINI /> jrmon -c
JNIOR Active I/O Monitor
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  [C]lose NNN, [L]ist Counters, [O]pen NNN, [P]ulse
  [Q]uit, [R]eset, [S]et Counters NNN, [U]sage
  NNN - list of 1-8 input/relay selection
  '=' to specify parameter (pulse duration in msec, counts)
  '<' or '>' for command history

   8-DINn-1  8-RLYn-1      Default pulse = 5000 msec
   00000000  00000000  > u
```

```
din1  20589298 msec (5.71 hrs)
din2  0 msec (0.00 hrs)
din3  0 msec (0.00 hrs)
din4  0 msec (0.00 hrs)
din5  0 msec (0.00 hrs)
din6  0 msec (0.00 hrs)
din7  0 msec (0.00 hrs)
din8  0 msec (0.00 hrs)
rout1 1388597 msec (0.38 hrs)
rout2 90092 msec (0.02 hrs)
rout3 85195 msec (0.02 hrs)
rout4 80289 msec (0.02 hrs)
rout5 75164 msec (0.02 hrs)
rout6 69945 msec (0.01 hrs)
rout7 65173 msec (0.01 hrs)
rout8 60577 msec (0.01 hrs)

*  00000000  00000000  > _
```

Note that the jr310 then supports 16 Usage Meters covering the 8 digital inputs and 8 relay outputs. The total time is displayed in milliseconds (msec) and also in hours to the one-hundredth. Here we see that the first digital input (din1) has been in the “ON” state for over five and a half hours. In this example the remaining digital inputs have remained dormant and the relays have only been exercised briefly.

Diagnostic Mode

JRMON supports additional commands that are applicable to diagnostics. In order to enable these commands the user must start JRMON with the **-d** option. The **-d** option enables a superset of JRMON commands as can be seen in the following example.

```
TINI /> jrmon -d
JNIOR Active I/O Monitor
Copyright(c) 2005 INTEG process group, inc.  All Rights Reserved.

  [C]lose NNN, [L]ist Counters, [O]pen NNN, [P]ulse
  [Q]uit, [R]eset, [S]et Counters NNN, [T]est
  NNN - list of 1-8 input/relay selection
  '=' to specify parameter (pulse duration in msec, counts)
  '<' or '>' for command history

   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
*  00000000  00000000  > _
```

Presently only the Test command falls into this category and you can see that it now appears in the command summary displays in the header. Any diagnostic command entered in the **-c** control mode discussed earlier would be considered invalid. An error would result.

Diagnostic commands are meant to be used with the JNIOR out of its application environment. In this case the outputs of the JNIOR can be changed without regard as to the possible effect on surrounding equipment. Since it might not be good if a diagnostic command were accidentally evoked in application, JRMON is started in the separate mode as a safety precaution.

T - Test

The Test command starts the relay verification test. This command takes no parameters and must be the only command on the command line. Otherwise an invalid command error will result. During execution of the Test command the relays are cycled in order from Relay Output 1 through to Relay Output 8. Each relay is closed for 1 second. The test repeats indefinitely. Any keystroke will interrupt the process. Here's an example again where the italicized lines indicate the changing content of the monitor.

```
TINI /> jrmon -d
JNIOR Active I/O Monitor
Copyright(c) 2005 INTEG process group, inc.  All Rights Reserved.

  [C]lose NNN, [L]ist Counters, [O]pen NNN, [P]ulse
  [Q]uit, [R]eset, [S]et Counters NNN, [T]est
  NNN - list of 1-8 input/relay selection
  '=' to specify parameter (pulse duration in msec, counts)
  '<' or '>' for command history

   8-DINn-1  8-RLYn-1      Default pulse = 100 msec
/  00000000  00000000  > t
\  00000001  00000001  > (for ~1 second)
|  00000010  00000010  > (for ~1 second)
/  00000100  00000100  > (for ~1 second)
-  00001000  00001000  > (for ~1 second)
\  00000000  00010000  > (for ~1 second)
|  00000000  00100000  > (for ~1 second)
/  00000000  01000000  > (for ~1 second)
-  00000000  10000000  > (for ~1 second, user hits space bar)
\  00000000  00000000  > _
```

Note that this demonstrates a setup wherein the Relay Outputs 1 - 4 are wired to Digital Inputs 1 - 4 and a power source. You can see the inputs following the relay outputs in the case of those four relays. You can also see the progress of the twirling indicator that replaces the '*' in most of these examples. This Test diagnostic is useful for verifying relay operation as well as the operation of the various protocols and utilities (like JRMON) that display relay status. It also indirectly verifies the function of the clock.

Summary

Thank you for purchasing the **JNIOR**. Hopefully this manual made the getting-to-know process of your new **JNIOR** very quick and easy. The **JNIOR** has many more wonderful tools and features available, and are explained in detail in the supplied documents.

Please do not hesitate to contact our **JNIOR** team at **INTEG process group, inc**. We can be reached via phone, fax or e-mail as follows:

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