

v2 JRMON Command

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(as of v2.12.25)

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Revision History

<u>Date</u>	<u>OS Version</u>	<u>Change Description</u>
6/3/2005	v2.01.656	Added [U]sage command to display Usage Meters.
8/17/2006	v2.12.25	Added execute command line option (-x).

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 JNIO users who can successfully log into the OS command mode. Any keystroke will exit the program. The following is a typical display:

```
TINI /> jrmon
JNIO 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 (-c command line option)

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
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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 = 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 redisplayes 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 or 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 JNOR outputs can simultaneously 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 by 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 redisplay 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 > 1

    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
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 = 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.

Immediate Command Execution (-x command line option)

Using the **-x** option on the command line those logged into the OS command mode as administrators may use JRMON to immediately change the status of the eight relay outputs. Any of the Output Control command sequences documented above may be used.

```
TINI /> jrmon -x c12o3

TINI />
```

In this example Relay Outputs 1 and 2 would close and Relay Output 3 would open.

Diagnostic Mode (-d command line option)

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 2. 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.

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```
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.