



JNIOR

**A Network I/O Resource
Utilizing the JAVA™ Platform**

User's Manual

Release 1.4

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Utilizing the JAVA™ Platform**

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1 INTRODUCTION

1.1 Overview

JNIOR, A Network I/O Resource utilizing the JAVA™ platform, is a cost effective digital and analog interface that communicates over a network using TCP/IP via a 10BaseT Ethernet Port. **JNIOR** is a self-contained, general-purpose I/O box that is easily configured by the end user for remote control and monitoring of their equipment via a standard web browser (such as Microsoft's Internet Explorer). **JNIOR** also enables the user to bring previously unavailable signals to the network.

JNIOR contains an HTTP Server to host its own web pages, a Java Virtual Machine (JVM) for implementing application programs written in Java, including Applets, and File Transfer Protocol (FTP) and Telnet servers for loading software, system configuration, and maintenance.

The JVM and TCP/IP connectivity are the key technical features of **JNIOR**. Having the software written in Java allows the application to be developed in a desktop PC and easily ported into the **JNIOR**. The object-oriented Java programming language is ideal for developing modular classes that can be reused to minimize the cost of leveraging code into custom applications. The TCP/IP connectivity allows the **JNIOR** to be easily connected with other computers over an Ethernet network.

Applications include:

- Remote monitoring of equipment status
- Monitoring of process signals
- Interface with legacy systems
- Web enabling existing devices
- Linking I/O to existing operator interfaces
- E-mail alert

1.2 Features

1.2.1 Hardware

JNIOR is based on the Dallas Semiconductor TINI® (Tiny InterNet Interface) board; which is a highly integrated assembly that includes a Dallas' DS80C390 micro-controller, FLASH and SRAM memory, and a runtime operating system with an integral JVM.

JNIOR is the practical implementation of a TINI board into an embedded system product targeted for general purpose I/O connectivity. **JNIOR** places the TINI board into a protective case with an integral power supply and a variety of general-purpose analog and digital I/O points. External communications are handled via the 10Base-T Ethernet port and RS232 serial port.

The standard **JNIOR** consists of the following I/O and communication points:

- (4) Optically isolated digital inputs
- (2) Optically isolated digital outputs
- (2) Optically isolated counter inputs
- (2) Form-C SPDT relay outputs
- (4) Analog voltage inputs
- (2) Analog voltage outputs
- (1) Internal temperature sensor
- (1) RS232 Port
- (1) 1-Wire® Connection

With the addition of custom software, the external 1-Wire connection allows the user to connect additional I/O that utilizes 1-Wire chip technology from Dallas Semiconductor. Please contact INTEG process group for further information.

1.2.2 Software

The **JNIOR** software utilizes the standard operating system (OS) supplied with the Dallas Semiconductor TINI board. This operating system is a highly efficient OS developed with UNIX and MS-DOS like features and a JVM for running embedded Java applications. The **JNIOR** also contains a web server capable of using the Hypertext Transfer Protocol (HTTP) to communicate with a standard web browser over a local area network (LAN) or the Internet. The **JNIOR** web pages and Applets are thus served via this method. The **JNIOR** also acts as an e-mail client able to send e-mails using Simple Mail Transfer Protocol (SMTP) to an e-mail server on the network.

The main **JNIOR** application program is a stand-alone program that provides the **JNIOR** product's I/O points with a method for connectivity and configuration and auto-executes upon power-up. When the customer connects to the **JNIOR** with a web browser, the user is greeted with the **JNIOR** home page. From there the user has the option to launch the Configuration or Monitor and Control web pages/Applets.

Communications with the **JNIOR** for software transfer can be done via the serial server, which provides a means to login via the RS232 serial port or the Telnet server, which provides a means to login via the Ethernet port (See Section 2). This connectivity makes the **JNIOR** accessible for set-up and maintenance via a desktop client. An FTP server provides a means to transfer files to and from the **JNIOR**'s file system (See Section 6).

Custom software development can be done on the desktop with standard software development tools for developing web pages (HTML) and Java code. Customizing the web pages for the customer's needs are easily done by off loading the standard web pages supplied with the **JNIOR** and then editing them with a product such as Microsoft Front Page. Customization of the Monitor and Control Applet and Configuration Applet is possible, but requires additional information and authorization from INTEG process group. Please contact INTEG at sales@integpg.com should you be interested in this feature.

1.3 Specifications

Power Input	
Input Voltage	7 to 30 Volts DC or AC, 500 mAmp min.
Digital Inputs (4)	
Range	0 to 30 VDC or VAC
Logic Low input	0 to 1.0 V
Logic High input	2.0 to 30 V
Input Resistance	1.5 K ohm nominal
Counter Inputs (2)	
Voltage Range	0 to 30 VDC or VAC
Freq. Range	0 to 1000 counts/sec.
Logic Low input	0 to 1.0 V
Logic High	2.0 to 30 V
Minimum pulse width	1 mS @ > 2.0 V
Digital Outputs (2)	
Source Input Voltage	5.0 to 30.0 VDC
Output Current	1 Amp max.
Relay Outputs (2)	
Type	SPDT, Form C
Contact Ratings	1 Amp @ 24 VDC or 0.5 Amp @ 125 VAC max.
Analog Inputs (4)	
Input Voltage	0 - 5 VDC or 0 - 10 VDC, Single Ended
Bit Resolution	8, 10, 12 or 16 Bits, Software Configurable
Input Resistance	20 K ohm minimum
Analog Outputs (2)	
Output Voltage	0 to 10 VDC
Output Current	10 mAmp Max.
RS232 Serial Port (1)	
Baud Rate	DB-9 female with 9 pin DTE pinout 115200 baud
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
10baseT Ethernet (1)	
	RJ-45 Connection
1-Wire Interface (1)	
	RJ-11 Connection

2 GETTING STARTED

2.1 Equipment Supplied/Needed

The standard **JNIOR** is shipped with one or more of the following items:

- **JNIOR**
- Power adapter (optional)
- Ethernet cable – straight (optional)
- Ethernet cable – crossover (optional)
- RS232 serial cable (optional)

The method of installation and connection of the **JNIOR** will determine which items are needed and are further defined in the following sections.

2.2 Power Connection

The **JNIOR** uses a 2-piece terminal connector system for all power and I/O wiring connections allowing for easy installation and/or removal.

The **JNIOR** can be powered with 7 to 30 volts AC or DC. A standard wall transformer (AC power converter), which is available from INTEG or most electronic stores, can be used for converting 120 volts AC to 9 or 12 volts DC. The transformer should supply a minimum of 500 mA of current. The end with the barrel connector (or similar connector) should be cut-off and the wires stripped back.

Connect the power wires to the power terminal blocks on the **JNIOR**. These are labeled P1 and P2 along the top edge of the **JNIOR**. The power input to the **JNIOR** is not polarized.

DO NOT APPLY POWER TO THE JNIOR UNTIL INSTRUCTED. If you must change the factory set IP address of your **JNIOR**, then you must follow the instructions in section 2.4 before applying power. However, if you do not need to reconfigure the IP settings, then it is okay to apply power.

Before connecting any I/O, the user should configure the **JNIOR** for their specific network requirements.

2.3 Passwords

Username and passwords can be setup and configured for the **JNIOR** to provide and limit access to **JNIOR** functions. The **JNIOR** username and password function is an extension of the TINI™ Slush operating system provided with the TINI™. All privileges are granted based on the user ID number configured for the username and password. The **JNIOR** privilege levels based on the user ID number as follows:

<u>Privilege Level</u>	<u>User ID Number Range</u>
Monitor Only	0 - 31
Monitor and Configure	32 - 63
Control and Monitor	64 - 95
Configure, Monitor and Control	96 – 127
Admin	128 – 254
Invalid ID number	255 * Do not use this ID number

The privilege levels are defined as follows:

- Monitor Only: This privilege level allows the user to access only the **JNIOR** Monitor Applet. When logged as a username with this privilege level the control buttons will be disabled (grayed out), preventing the user from changing any outputs.
- Monitor and Configure: Privilege level provides the same privilege level as the Monitor Only and additionally provides privilege to access the **JNIOR** Configuration Applet allowing the user to configure the **JNIOR**.
- Control and Monitor: Access to the **JNIOR** Monitor Applet only is provided. All output control buttons will be enabled allowing users logged with this privilege level to change the outputs.
- Configure, Monitor and Control: A user logged in with this privilege level will have access to both the **JNIOR** Monitor and Configuration Applets. All output controls on the **JNIOR** Monitor Applet will be enabled. Also this privilege level allows the user to change the **JNIOR** configuration.
- Admin: An admin level password provides **JNIOR** privilege levels the same as the Configure, Monitor and Control privilege level. In addition to **JNIOR** privileges any user with this privilege level also is granted Admin rights for the TINI Slush operating system. It is recommended that only one user be configured as an Admin user and use the user ID number 128.
- Invalid ID number: This ID number is invalid for use as a **JNIOR** user. This is a valid user ID for the TINI Slush operating system. If a user is assigned this user ID number the user will be granted Admin privileges at the TINI Slush operating system. But no privileges are granted for the **JNIOR** and will always return a Login Failed message.

The factory (default) settings for the **JNIOR** passwords are:

<u>Username</u>	<u>Password</u>	<u>User ID Number</u>
jnior	jnior	128

It is recommended that these usernames and passwords be reconfigured prior to installation. The **JNIOR** username and password will be well known and any unwanted users will be able to access your **JNIOR** with Admin privileges. Note that a user must be an Admin user to add or del usernames from the system.

ADDING A USERNAME

A username can be added to the **JNIOR** by establishing a Telnet connection to the **JNIOR** and logging in as an Admin user. From the command line enter the following command:

```
useradd -n username -p password -i user ID number
```

```
Ex: /> useradd -n jnior -p jnior -i 128
```

DELETING A USERNAME

A username can be deleted from the **JNIOR**. Establish a Telnet connection to the **JNIOR** and log in as an Admin user. From the command line enter the following command:

```
userdel username
```

```
Ex: /> userdel jnior
```

CHANGING A USER'S PASSWORD

A user's password can be changed by establishing a Telnet connection to the **JNIOR** and logging in as a Admin user. From the command line enter the following command:

```
passwd username
```

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.

```
Ex: />passwd jnior
Enter in the new password: new password
Confirm the new password: new password
```

Note that the password will not be displayed as you type.

LISTING THE CONFIGURED USERS

A list of all usernames and user ID numbers can be acquired. To list the usernames and user ID's perform the following after establishing a Telnet connection to the **JNIOR** and logging in as an Admin user:

1. Change to the etc directory – `cd etc`
2. List the password file to the screen – `cat passwd`

Note that the passwords are encrypted and if a password is lost or forgotten then an admin user can change that users password or delete the user and then add the user back with a known password.

2.4 Networking Setup

The **JNIOR** is typically connected to a local area network (LAN), for access by users on the network. In some instances, this LAN can be accessed by the outside world via the Internet. The **JNIOR** can also be connected directly to an Ethernet card of a personal computer, but will require a special type of Ethernet cable called a crossover Ethernet cable. In either configuration, the **JNIOR** is then accessed using a standard web browser, such as Internet Explorer, by typing in the Internet Protocol (IP) address of the **JNIOR** into the address line of the web browser.

The **JNIOR** is shipped from the factory with the standard IP address of 10.0.0.201 and the following settings:

```
TINI /> ipconfig

Hostname       : TINI.
Current IP     : 10.0.0.201
Default Gateway : 10.0.0.1
Subnet Mask    : 255.255.255.0
Ethernet Address : 00:60:35:00:76:71
Primary DNS    :
Secondary DNS  :
DNS Timeout    : 0 (ms)
DHCP Server    :
DHCP Enabled   : false
Mailhost       :
Restore From Flash: Not Committed
```

Depending upon the configuration of your network, this above configuration may or may not work. Your network administrator should be able to help you with the settings required for your **JNIOR**. If you need to change the IP configuration of your **JNIOR**, you can do it several ways. If you do NOT need to reconfigure your IP settings, then you can skip this section.

2.4.1 Connections

The **JNIOR** contains Ethernet and serial port connections along its bottom edge. The Ethernet port accepts a standard CAT5 cable with an RJ-45 connector. The serial port accepts a standard serial cable with a DB-9 connector.

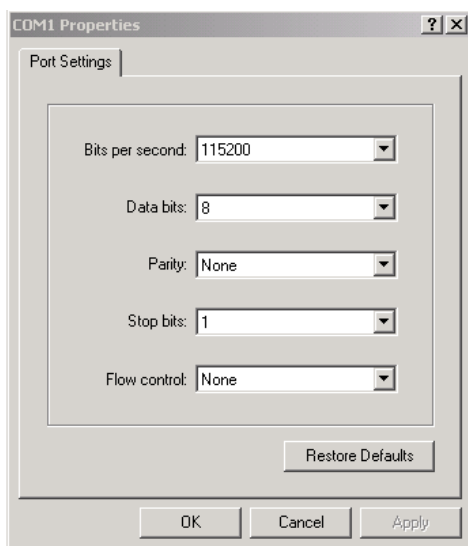
2.4.2 Serial Connection

If you are unable to connect to the **JNIOR** via your PC and an Ethernet cable using the factory set IP configuration, then you must configure your **JNIOR** IP address using the RS232 port and a serial cable. Use a straight through wired DB-9 Male to DB-9 Female connector serial cable. Note that the port on the **JNIOR** is a DCE type serial port.

Connect the RS 232 serial cable to the connector marked RS232. Connect the other end of the serial cable to either COM1 or COM2 on a Microsoft Windows based computer. This connection is only required for setup and can be removed once the task is complete.

*NOTE: Although the **JNIOR** may be accessed and configured via other operating systems, the User's Manual is based on using a Microsoft Windows environment. It is up to the user to determine how to implement the same functions described herein in a non-Windows environment.*

Start up a terminal session on the COM port to which the **JNIOR** is connected. An example program would be using HyperTerminal in Windows. The terminal program should be set for 115200 baud, 8 bits, no parity, 1 stop bit, and no handshaking (flow control) and look as follows:



After you have connected the serial cable and configured your HyperTerminal session, apply power to the JNIOR. Doing it in this order will allow you to observe the **JNIOR** boot-up text.

A sign-on banner will be displayed and then after about 30 seconds, the login prompt will be displayed:

TINI login:

Enter the <user ID> for System Services supplied with your **JNIOR**. After entering the user ID, the password prompt is displayed:

TINI password:

Enter the <password> supplied with your **JNIOR**. After entering the password, the **JNIOR** system prompt is displayed:

TINI />

If you are successful, your screen should look like the following:

```

JNIOR Configuration - HyperTerminal
File Edit View Call Transfer Help

[ Not generating log file. ] [Info]
[ Initializing shell commands... ] [Done]

[ Checking system files... ] [Done]

[ Initializing and parsing .startup... ]
[ Initializing network... ]
[ Starting up Telnet server... ] [Done]
[ Starting up FTP server... ] [Done]
[ Network configuration ] [Done]
[ System init routines ] [Done]

[ slush initialization complete. ]

Hit any key to login.

Welcome to slush. (Version 1.02d)

TINI login: root
TINI password:
TINI /> _

Connected 0:02:28 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

```

Note that the `ipconfig` command has to be run from the serial port since the Ethernet port is out of service while it is being configured.

The `ipconfig` command has several options associated with it and they can be viewed by typing, `help ipconfig` at the System Services command line prompt. The options are displayed below.

```

JNIOR Configuration - HyperTerminal
File Edit View Call Transfer Help

TINI /> help ipconfig
ipconfig [options]

Configure or display the network settings.
[-a xx.xx.xx.xx] Set IP address. Must be used with the -m option.
[-n domainname] Set domain name
[-m xx.xx.xx.xx] Set subnet mask. Must be used with -a option.
[-g xx.xx.xx.xx] Set gateway address
[-p xx.xx.xx.xx] Set primary DNS address
[-s xx.xx.xx.xx] Set secondary DNS address
[-t dnstimeout] Set DNS timeout (set to 0 for backoff/retry)
[-d] Use DHCP to lease an IP address
[-r] Release currently held DHCP IP address
[-x] Show all Interface data
[-h xx.xx.xx.xx] Set mailhost
[-C] Commit current network configuration to flash
[-D] Disable restoration of configuration from flash
[-f] Don't prompt for confirmation

TINI />

TINI />

TINI />

Connected 0:04:28 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

```

`Ipconfig` is the command that allows the Ethernet port to be configured. On the **JNIOR**, for a static IP network, use the command line below:

```
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

NOTE: Although there is a `-C` command for committing the `ipconfig` to flash, it is highly recommended that you do NOT use this feature because once the `ipconfig` is committed to flash, a special program is required to change the flash setting. The `ipconfig` is held in battery backed RAM and will not be lost unless the battery is removed or fails.

On a private network, such as within a company, the IP address may be something like 169.144.25.10

The mask for this network would be 255.255.0.0 Another common mask is 255.255.255.0

The gateway often, although not always, is the .1 of the IP address. In the above example it would be 169.144.25.1. The gateway address is the IP address of the Ethernet hub the **JNIOR** is plugged into.

The primary and secondary name servers provide aliases for the IP addresses of other devices on the network. If other devices are referred to by their IP address only and not by name, then either name server has to be setup.

The mailhost is the IP address of the server that handles any out-going e-mail messages from the **JNIOR**. If the emailing features of the **JNIOR** are not going to be used, then setup of the mailhost is not necessary.

If the **JNIOR** is to be connected to a dynamic network using DHCP, IP addresses are provided to the **JNIOR** automatically when the **JNIOR** boots up. The command to configure the **JNIOR** for a DHCP network is:

```
ipconfig -d
```

If there is already a DHCP configuration, use `ipconfig -r` to release that IP address before configuring for a new IP address.

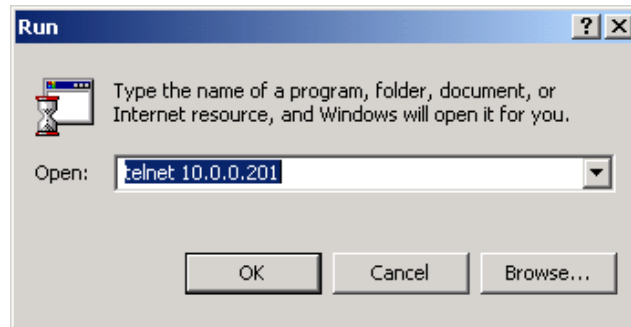
When finished with your HyperTerminal session, type `logout` on the command line to end your session.

2.4.3 Ethernet Connection

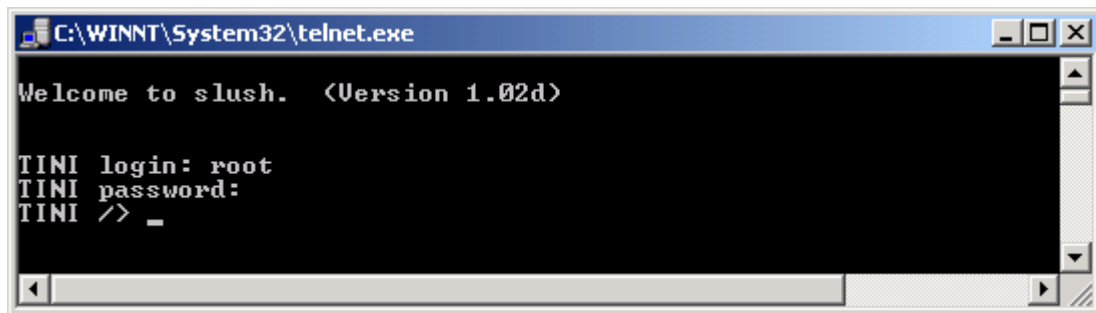
It is possible to connect to the **JNIOR** with the Ethernet port even if the factory set IP address is wrong for your network. This would require the use of an Ethernet crossover cable and connecting it directly from the Ethernet port on your desktop or laptop computer to the Ethernet connection on the **JNIOR**. Utilizing this method requires you to use a Telnet session instead of a terminal session (as described previously). The network connection on the PC must have the same subnet configured as the **JNIOR**. (i.e. IP=10.0.0.200 Mask=255.255.255.0)

A Telnet session is started by using the Start, then Run command on a Windows based PC. When the Run dialogue box comes up, type in Telnet and the IP address of the **JNIOR**. If your **JNIOR** is still set to the factory set IP address, then you would type in `telnet 10.0.0.201`.

Your computer screen should look as follows:



After you click okay, you are connected to the **JNIOR** and a MS-DOS like window will be open, enter your <username> and <password> for System Services supplied with your JNIOR. Your computer screen should look as follows:



From here, you can use the same commands for configuring your IP information as described previously for use in the RS232 connection using HyperTerminal.

When finished with your Telnet session, type `logout` on the command line to end your session.

2.4.4 JNIOR IP Port Number

The **JNIOR** comes shipped from the factory configured to communicate over your network using ports 80 and 443. Port 80 is the standard port for launching web pages and cannot be changed. Port 443 is the selectable port that is used by the **JNIOR** for communicating with its Applets. This is a port that is typically available. However, should this port not be available or should you wish to change your port number, please use the following steps.

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 Applets, it is recommended you select a port number of 1024 or greater.

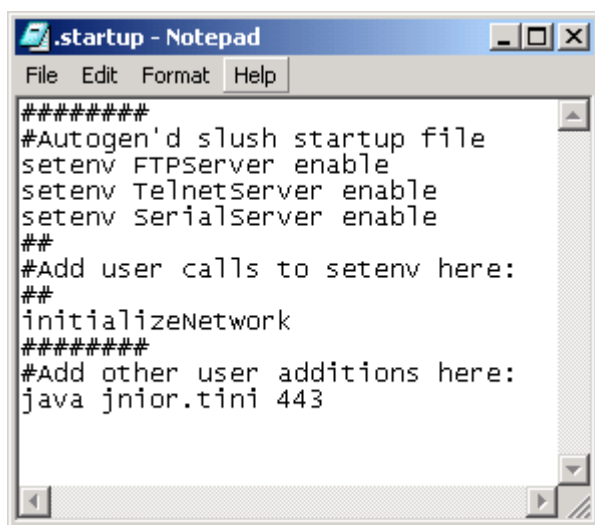
The 443 port number is set in the ".startup" file in the "etc" directory. This file can be edited using widely available packages such as Notepad or WordPad that are typically supplied with a Windows based PC.

In order to edit the .startup file to change your port number, the file must be located in a directory on your Windows based PC. You can use your back-up files supplied with your **JNIOR** (providing you have not made any changes) or transfer the files from your **JNIOR** to your PC using FTP. Please see your Software Restoration Application Note and your User's Manual for assistance.

Please use Notepad, WordPad or any other appropriate package to make the following changes. Use the FTP **get** command to place a copy of the appropriate file from the **JNIOR** into your working directory on your Windows based PC and use the FTP **put** command to place the updated file back in the appropriate **JNIOR** directory. The **put** command will write over the version already stored on the **JNIOR**.

1) ".startup" File

When you open the .startup file, you will see the following. Please change the number 443 in the last line to your desired port number. You must save the modified file with the same name (.startup) and use FTP to replace the current version loaded on your **JNIOR**.



After you have completed the above, restart your **JNIOR** by cycling the power off for at least 5 seconds. When you reapply the power, the **JNIOR** will utilize the new port number for the Applets.

2.5 Getting Started

Once the **JNIOR** is connected to your network or computer and configured with the proper IP set-up, the inputs and outputs can be configured, monitored and controlled using a network browser, such as Internet

2.5.1 Starting the JNIOR Home Page

Start a browser session. In the address line of the browser type:

`http://10.0.0.201` (or your customized IP address)

Where 10.0.0.201 is the default IP address of the **JNIOR**

The **JNIOR** Home Page should come up within 15 seconds. From the Home Page, you can launch the Monitor and Control or Configuration web page/Applets or enter them directly via the following.



JNIOR Home Page

JNIOR - A Network I/O Resource utilizing the Java™ platform

JNIOR

Welcome to your JNIOR Home Page.

From here you can launch your Configuration Applet or Monitor and Control Applet by clicking on the appropriate link below.

[Launch Monitor Applet](#)

[Launch Config Applet](#)

Welcome to your JNIOR ("junior") Home Page.

From your Home Page you can request the two standard Applets that come with each JNIOR - the Monitor and Control Applet and the Configuration Applet. The Monitor and Control Applet allows you to view your digital, analog and high speed counter inputs and to manually control your digital and analog outputs. The Configuration Applet allows you to customize the text, the scaling and the alarm handling for each input and output signal and the system set-up parameters.

If this is your first time accessing the JNIOR, then you should launch the Configuration Applet to set-up your JNIOR.

When you [launch the Configuration Applet](#), please enter the appropriate Username and Password provided with your JNIOR, click OK and then you can:

- Change the description for an I/O point
- Enable/disable alarm handling
- Scale an analog signal
- Set system parameters

When you [launch the Monitor and Control Applet](#), please enter the appropriate Username and Password provided with your JNIOR, click OK and then you can:

- Monitor the status/values being fed back to your digital, analog and high speed counter inputs.
- Control (Toggle) the status of your digital outputs
- Control (Set) the value for your analog outputs

If you are having any problems or difficulties with your JNIOR or have any questions, please call our technical support at 1-877-256-1823 ext. 10, Monday through Friday, 8:30 am to 5:00 pm (EST).

You can also access our JNIOR customer website. There you will find the latest releases of the Quick Start Guide, User's Manual and software. A section on Frequently Asked Questions will also be available.

[Monitor Applet](#) | [Configure Applet](#) | [JNIOR Support](#) | [INTEG Home Page](#)

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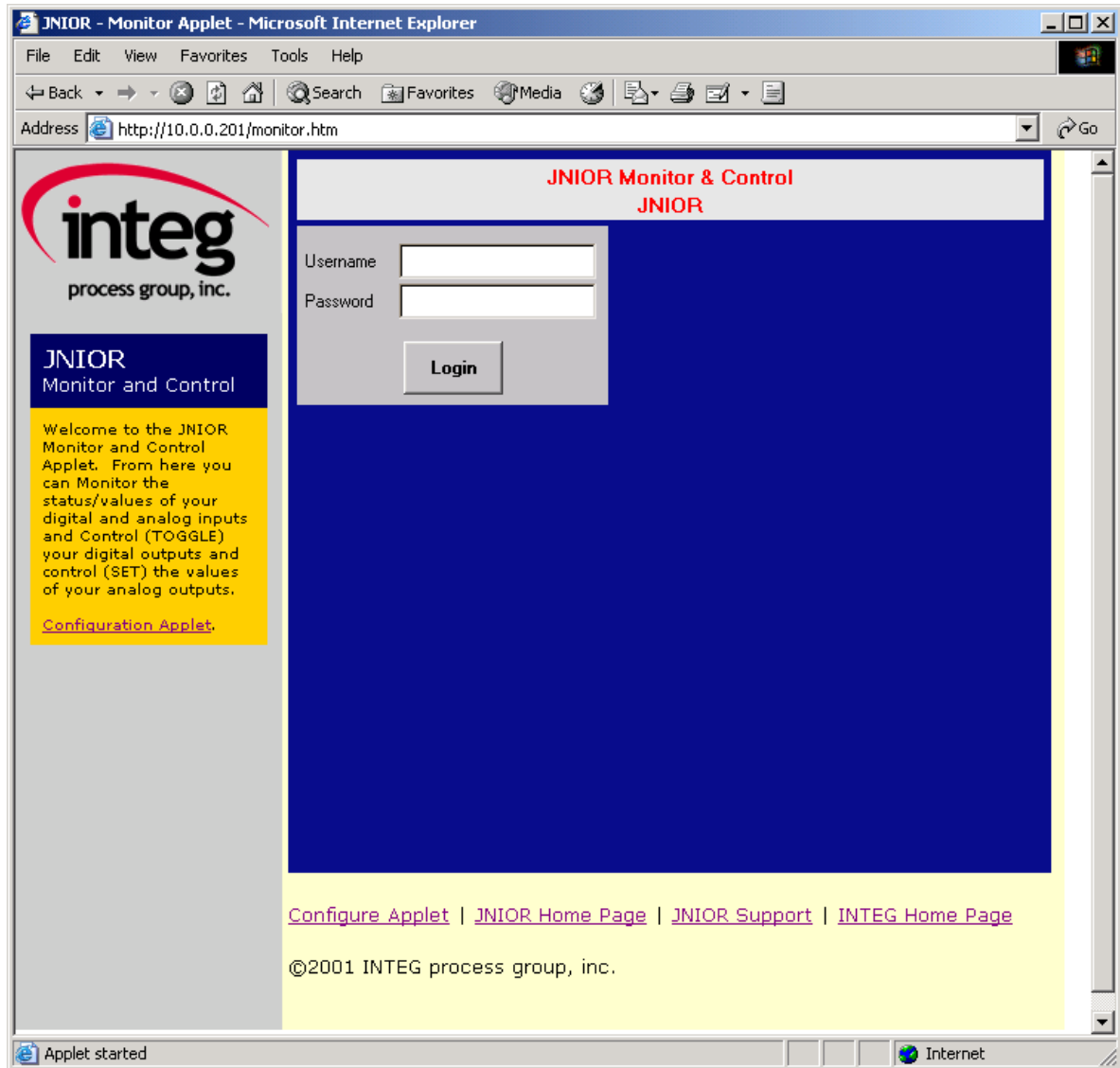
2.5.2 Starting the Monitor and Control Web Page

Start a browser session. In the address line of the browser type:

`http://10.0.0.201/monitor.htm` (or your customized IP address)

Where 10.0.0.201 is the default IP address of the **JNIOR**

The **JNIOR** Monitor and Control web page should come up within 15 seconds.



Please enter your <username> and <password> configured for your **JNIOR**.

The operation of the Monitor and Control Applet is described later in this manual.

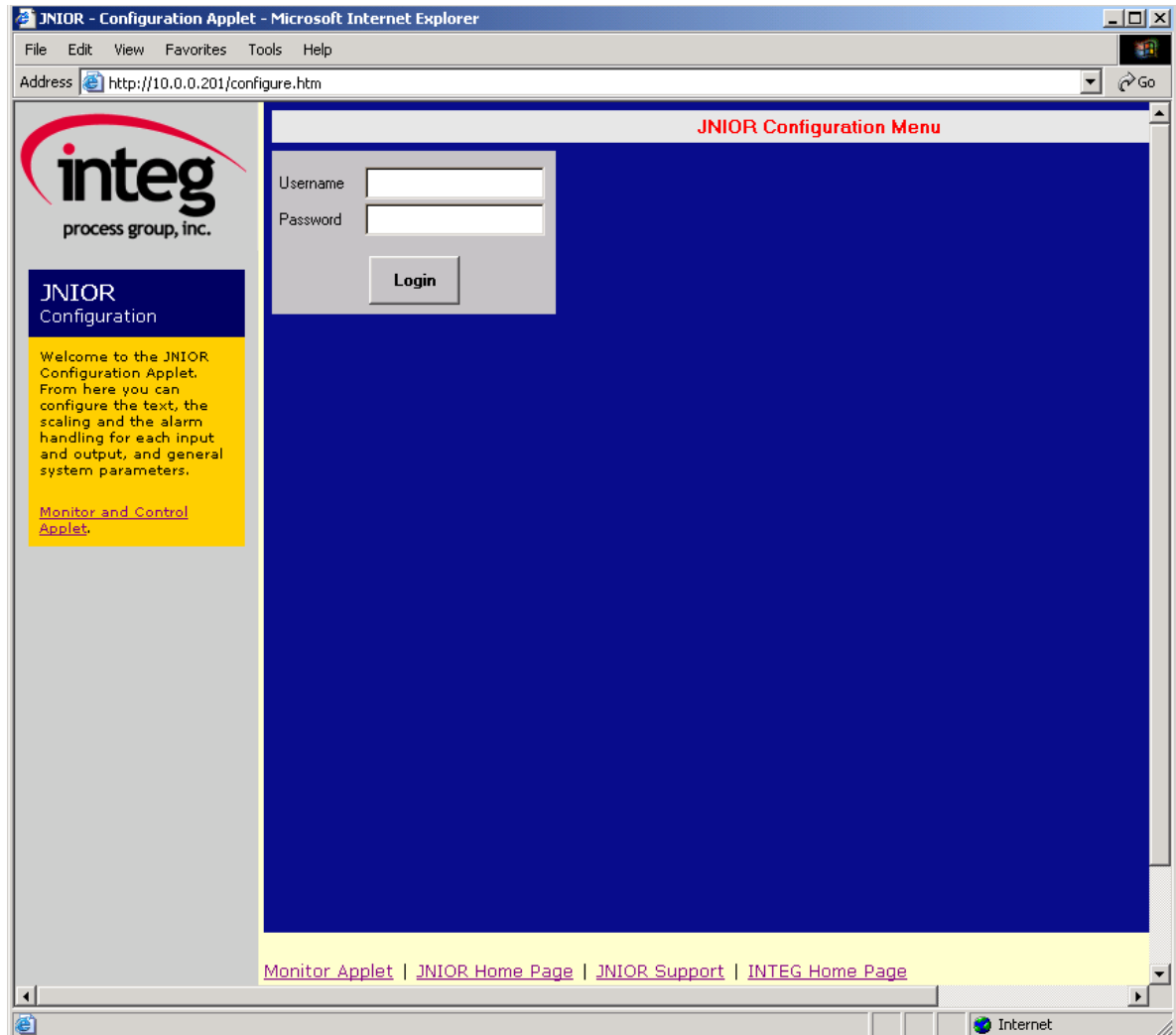
2.5.3 Starting the Configuration Web Page

Start a browser session. In the address line of the browser type:

`http://10.0.0.201/configure.htm` (or use your customized IP address)

Where 10.0.0.201 is the default IP address of the **JNIOR**

The **JNIOR** Configuration web page should come up within 15 seconds.



Please enter your <username> and <password> configured for your **JNIOR**.

The operation of the Configuration Applet is described later in this manual.

3 I/O DESCRIPTION

3.1 Digital Inputs (4)

The **JNIOR** is equipped with four (4) optically isolated digital inputs. Each digital input can accept AC or DC voltage sources in the 5 – 30 V range. An LED associated with each digital input displays the current status of the input. Isolation of each digital input allows the user to connect inputs to different sources without addition of isolation devices.

3.2 Counter Inputs (2)

The **JNIOR** is equipped with two (2) counter inputs that accept AC or DC voltage sources in the 5 – 30 V range. Each counter input has a status LED that displays the current input status. The counter input is negative edge triggered and only increments the count when a high to low transition at the input is detected. The counter has built-in de-bouncing and requires a minimum input pulse of 460 μ s. The built in de-bouncing allows for connection to mechanical switches without additional de-bouncing hardware.

3.3 Digital Outputs (2)

The **JNIOR** is equipped with two (2) digital outputs that are used to switch current on or off. Each digital output is optically isolated and capable of switching voltage sources of 5 – 30VDC @ 1A. The digital outputs require an external power source to be connected to the DOUT+ and DOUT- terminals. The digital outputs use a common power source and are not isolated from each other.

3.4 Relay Outputs (2)

The **JNIOR** is equipped with two (2) Relay Outputs with each being a Form C SPDT relay contact providing Normally Open and Normally Closed contacts with a Common wire. Each relay output is independent and isolated from the other relay output. Each relay contact rating is 1A @ 24VDC or 0.5A @ 125VAC although the voltage source must be in the range of 5 – 30V AC or DC.

3.5 Analog Inputs (4)

The **JNIOR** is equipped with four (4) configurable Analog Inputs that are capable of reading input voltages in the 0 – 10V range. Each Analog Input can be configured for 8, 10, 12 or 16 bit resolution and input voltage ranges of 0 – 5V or 0 – 10V. The analog input provides a Common and Voltage Input connection. To avoid analog noise problems it is recommended to keep wiring length for the analog inputs to a minimum (< 50 ft.).

3.6 Analog Outputs (2)

The **JNIOR** is equipped with two (2) Analog Outputs capable of providing 0 – 10 VDC @ 10mA output with 8-bits of resolution. Current loads exceeding 10mA on the Analog Output will result in unreliable operation or possible damage to the **JNIOR**. Because of Analog noise problems it is recommended that the wire length used to connect the Analog Outputs be kept to a minimum (<50 ft.).

3.7 Temperature Input (1)

The **JNIOR** is equipped with support for a single Temperature Input. The temperature input is based on the Dallas Semiconductor 1-Wire™ Temperature Sensor (DS18S20). The **JNIOR** comes from the factory with an internal temperature sensor that is built into the **JNIOR** product. This temperature sensor is dependent on the JNIOR operating temperature. The need to measure temperatures outside or remote of the **JNIOR** can be accomplished. The built-in temperature sensor can be disabled and a temperature sensor connected to the **JNIOR** 1-Wire Extension port.

NOTE: Adding an external temperature sensor does require reconfiguration of the JNIOR Temperature Input. Please reference the ADVANCED chapter section, Configuring an External Temperature Sensor.

3.8 1-Wire Extension

The Dallas Semiconductor 1-Wire Bus may be extended beyond the **JNIOR** box to add additional 1-Wire I/O resources via the RJ-11 1-Wire Extension port. In addition to the 1-Wire connection, the 1-Wire Extension port provides a power source to the unregulated **JNIOR** power input terminal and a regulated 5VDC source. The 1-Wire Extension port has the following pin out:

- 1 - + 5VDC (100mA Max.)
- 2 - GND
- 3 - 1-Wire Data
- 4 - GND (1-Wire Return)
- 5 - No Connect
- 6 - V+ Unregulated

NOTE: Adding devices based on the Dallas Semiconductor 1-Wire chip technology requires additional software support. Contact INTEG process group, inc. for additional information regarding expansion of the 1-Wire bus.

3.9 Serial Communications (RS-232)

The **JNIOR** serial communication port provides a connection to the **JNIOR** Serial Server. The Serial Server can be used to configure **JNIOR** network settings. The Serial Server can be accessed using a terminal program such as HyperTerminal. The communication settings for the **JNIOR** serial port are:

- Baud Rate - 115,200 Baud
- Data Bits - 8 Bits
- Parity - None
- Stop Bits - 1
- Flow Control - None

3.10 Ethernet Communications

The **JNIOR** provides an RJ-45 connection jack used to connect the **JNIOR** to a 10BaseT Ethernet Network.

4 CONFIGURATION MENU

The Configuration Menu (or Applet) allows the user to customize the text displays and features associated with each I/O point. Once the configuration is complete, the details are uploaded to **JNIOR's** internal database and used to set the unit's operating parameters.

4.1 Accessing the Configuration Applet

The Configuration Applet is accessed via a web browser. In the address line of the browser type:

address) <http://10.0.0.201/configure.htm> (or use your customized IP address)

Where 10.0.0.201 is the default IP address of the **JNIOR**

The **JNIOR** Configuration web page login should come up within 15 seconds. Please enter the <username> and <password> (use the one provided with your **JNIOR** for CONFIGURATION purposes) and then click the Login button. The Configuration Applet will be displayed as follows:

integ
process group, inc.

JNIOR Configuration

Welcome to the JNIOR Configuration Applet. From here you can configure the text, the scaling and the alarm handling for each input and output, and general system parameters.

[Monitor and Control Applet](#)

JNIOR Configuration Menu

Digital Input

Select Input Number: DIN 1

Description: Digital In 1

On Label: True

Off Label: False

☐ Alarm on False(else True)

☐ Invert Input

☐ Enable Alarm

☐ Enable E-mail of Alarms

Accept Cancel

Digital Output

Select Output Number: DOUT 1

Description: Digital Out 1

On Label: True

Off Label: False

☐ Invert Output

Accept Cancel

Relay Output

Select Output Number: ROUT 1

Description: Relay Out 1

On Label: True

Off Label: False

☐ Invert Output

Accept Cancel

Analog Input

Select Input Number: AIN 1

AI Range: 0 - 10V

Hi Alarm: 0.0

Lo Alarm: 5.0

Units: units

Scaling: 0.0, 10.0

Resolution: 16 bit

Description: Analog In 1

☐ Hi Alarm Enable

☐ Lo Alarm Enable

☐ Enable E-mail of Alarms

Accept Cancel

Analog Output

Select Output Number: AOUT 1

Units: units

Scale: 0.0, 10.0

Description: Analog Out 1

Accept Cancel

Counter Input

Select Input Number: CNT 1

Units: units

Multiplier: 1.0

Alarm 1: 0.0

Alarm 2: 0.0

Description: Counter In 1

Sample Time(s): 0.0

☐ Alarm 1 Enable

☐ Alarm 2 Enable

☐ Enable E-mail of Alarms

Accept Cancel

Temperature Input

Description: Temperature

Hi Alarm: 85.0 deg F

Lo Alarm: 0.0 deg F

☐ Hi Alarm Enable

☐ Lo Alarm Enable

☐ Enable E-mail of Alarms

☒ Enable Temperature Sensor

Accept Cancel

Communications

E-Mail Delay(sec): 10

E-Mail Repeat: 5

E-Mail Address: alarm@company.com

Jnior Description: JNIOR

Accept Cancel

Time & Date

05/06/2002 08:06:18 AM

After Configuring all the points, press this button to Upload changes.

Upload to JNIOR

Version 1.21

[Monitor Applet](#) | [JNIOR Home Page](#) | [JNIOR Support](#) | [INTEG Home Page](#)

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4.2 Configuring Digital Inputs

There are a total of four independent digital inputs on the **JNIOR** that are independently configurable. To select the desired digital input, use the drop down box at the top of the digital input section. After selecting the desired input, the current configuration information for that digital input will be displayed. If you wish to change the configuration information for that input, change the information in each of the fields for that digital input, then click on the “Accept” button. The “Accept” button temporarily saves the configuration information to a database. Continue to change the configuration data for each digital input, selecting the “Accept” button after each change.

4.2.1 Configuration Field information

- Select Input Number – The drop down menu is used to select the digital input to be configured. Your choices are DIN 1, DIN 2, DIN 3 or DIN 4. You first click on the drop down arrow and then click on the digital input number to be configured. After you select your desired input, you can make your changes.
- Description – The Description field is the text that will be shown on the Monitor and Control Applet for the description of the associated digital input point. This field can be approximately 12 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.
- On Label – The On Label field is the text that will be displayed for the associated Digital Input on the Monitor and Control Applet when the input is “On” (true). This field can be approximately 10 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.
- Off Label - The Off Label field is the text that will be displayed for the associated Digital Input on the Monitor and Control Applet when the input is “Off” (false). This field can be approximately 10 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.
- Invert Input – The Invert Input checkbox is used to invert the internal state of the input, opposite the actual state of the hardware input. For example, normally, if voltage is detected at the digital input, the internal state and Monitor and Control Applet will show “On” (true). However, if

the Invert Input checkbox is checked, when voltage is detected at the digital input, the internal state and Monitor and Configuration Applet will show “Off” (false).

- Alarm on False – The Alarm on False checkbox is used to invert the state when the alarm is active. If the box is not checked, the alarm will be set active when the input is “On” or “true” (voltage detected at input). However, if the Alarm on False checkbox is checked, the alarm will be set active when the input is “Off” or “false” (no voltage detected at the input).
- Enable Alarm – The Enable Alarm checkbox is used to turn alarming on or off for this particular I/O point. If the box is checked, internal alarming will be turned on. An alarm will be generated based upon the configuration of the Alarm on False checkbox and an alarm flag will become visible next to the corresponding digital input on the Monitor and Control Applet.
- Enable E-mail of Alarms – The Enable E-mail of Alarms checkbox is used to turn e-mail notification of an alarm condition on or off. If the box is checked, an alarm condition for this point will generate an e-mail to be sent to the e-mail address(es) entered on the Configuration Applet. (See Configuring Communications Settings in Section 4.8 of this manual for entering e-mail address(es)).
- Accept and Cancel – The Accept and Cancel buttons become highlighted (darkened) whenever a change is made to the information for an I/O point. Before you can configure the next I/O point of the same type, you must either click on Accept or Cancel. If you click on Accept, then the information is temporarily stored for uploading to the **JNIOR**. If you click on Cancel, then your previous set-up is restored. If you forget to click on either Accept or Cancel, a dialogue box will pop-up asking you what you want to do.

4.3 Configuring Counter Inputs

There are a total of 2 counter inputs on the **JNIOR**. The counter inputs utilize a high-speed counter chip that can count up to 1,000 transitions per second. The **JNIOR** reads the current value in the counter chip allowing the chip to count with a higher frequency than the scan time of the **JNIOR** program. Each input can be configured independently of the other. To select the desired counter input, use the drop down box at the top of the counter input section. After selecting the desired input, the data in all the boxes will be updated with the current configuration information for that input. If you wish to change the configuration information for the selected counter input, change the information in each of the fields, then click the "Accept" button. This will save the configuration information into a temporary database. Continue to change the configuration data for all the points, selecting the "Accept" button after each change.

4.3.1 Configuration Field information

- Select Input Number – The drop down menu is used to select the counter input to configure. Your choices are CNT 1 or CNT 2. You first click on the drop down arrow and then click on the counter input number to configure. After you select your desired input, you can make your changes.
- Units – The Units field is the unit of measure that the counter input is monitoring. Examples are Revolutions (rev), gallons (gal), etc. This field can be approximately 10 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet. The units entered do not effect the point measurement or any scaling of the value. It is only for graphical display.
- Multiplier – The Multiplier field is used for scaling the counter value to be displayed on the Monitor and Control Applet. The **JNIOR** reads the actual count from the high-speed counter chip and then multiplies it by the number entered in the Multiplier field before displaying it on the Monitor and Control Applet. If the Multiplier is set to 1, then the actual number of counts is displayed. A number greater than 1 acts as a multiplier and a number less than 1 acts as a divider. So the user can manipulate the count signal to be reflective of the meaning of 1 count by using the Multiplier field. For example, the user enters 1,000 to multiple by 1,000 and 0.001 to divide by 1,000.

- Alarm 1 – The Alarm 1 field is the set point at which the first alarm is generated. If the value of the counter input exceeds the set point, an alarm will be generated if alarm 1 is enabled. See the Alarm 1 Enable field.
- Alarm 2 – The Alarm 2 field is the set point at which the second alarm is generated. If the value of the counter input exceeds the set point, an alarm will be generated if alarm 2 is enabled. See the Alarm 2 Enabled field.
- Description – The Description field is the text that will be shown on the Monitor and Control Applet for the description of the associated counter input point. This field can be approximately 12 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.
- Sample Time – The sample time field is used to enter the sample time in seconds over which the counter value will accumulate and be displayed on the Monitor and Control Applet. For example, if a value of 60 is entered, then the counts accumulated during each 60 second period will be displayed (in other words, the count will accumulate until 60 seconds has lapsed and then it will be reset to 0 and start to count for another 60 seconds). This example would give you a counts-per-minute display. To display continuous or on-going accumulation of counts, set the sample time equal to 0.0. Sample times less than 1.0 are invalid will not enable the sample time operation. Continuous or on-going accumulation of counts will be displayed for sample times less than 1.0.
- Alarm 1 Enable – The Alarm 1 Enable checkbox is used to turn the alarm 1 on or off. If the box is checked, internal alarming will be turned on, so if the count value exceeds the alarm 1 set point, an alarm 1 flag will become visible next to the input on the Monitor and Control Applet.
- Alarm 2 Enable – The Alarm 2 Enable checkbox is used to turn the alarm 2 on or off. If the box is checked, internal alarming will be turned on, so if the count value exceeds the alarm 2 set point, an alarm 2 flag will become visible next to the input on the Monitor and Control Applet.
- Enable e-mail of Alarms – The Enable e-mail of Alarms checkbox is used to turn e-mail notification of an alarm condition on or off. If the box is checked, an alarm condition for this point will generate an e-mail to be sent to the e-mail address(es) entered on the Configuration Applet. (See Configuring Communications Settings in Section 4.8 of this manual for entering e-mail address(es)).
- Accept and Cancel – The Accept and Cancel buttons become highlighted (darkened) whenever a change is made to the information for an I/O point. Before you can configure the next I/O point of the same type, you must either click on Accept or Cancel. If you click on Accept, then the information is temporarily stored for uploading to the JNIOR. If you click on Cancel, then your previous set-up is restored. If you forget to click on either Accept or Cancel, a dialogue box will pop-up asking you what you want to do.

4.4 Configuring Digital and Relay Outputs

There are a total of 2 digital outputs and 2 relay outputs on the **JNIOR**. Each output can be configured independently of the others. To select the desired output, use the drop down box at the top of the digital output section to select digital output. After selecting the desired output, the data in all the boxes will be updated with the current information for that output. If you wish to change the configuration information for that output, change the information in each of the fields for that output, then click on the “Accept” button. This will put that information into a temporary database. Continue to change the configuration data for all the points, selecting the “Accept” button after each change.

The image shows a configuration window with two tabs: "Digital Output" and "Relay Output".

Digital Output Section:

- Select Output Number:** A dropdown menu showing "DOUT 1".
- Description:** A text field containing "Digital Out 1".
- On Label:** A text field containing "True".
- Off Label:** A text field containing "False".
- Invert Output:** An unchecked checkbox.
- Buttons:** "Accept" and "Cancel".

Relay Output Section:

- Select Output Number:** A dropdown menu showing "ROUT 1".
- Description:** A text field containing "Relay Out 1".
- On Label:** A text field containing "True".
- Off Label:** A text field containing "False".
- Invert Output:** An unchecked checkbox.
- Buttons:** "Accept" and "Cancel".

4.4.1 Configuration Field information

- **Select Output Number** – The drop down menu is used to select the digital or relay output to configure. Your choices are DOUT 1 or DOUT 2 or ROUT 1 or ROUT2. You first click on the drop down arrow and then click on the digital output number to configure. After you select your desired output, you can make your changes.
- **Description** – The Description field is the text that will be shown on the Monitor and Control Applet for the description of the associated digital output or relay output point. This field can be approximately 12 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.
- **On Label** – The On Label field is the text that will be displayed on the associated Output when the output is On (true). This field can be approximately 10 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.
- **Off Label** - The Off Label field is the text that will be displayed on the associated Output when the output is Off (false). This field can be approximately 10 characters in length, depending on

the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.

- Invert Output – The invert output check box is used to invert the internal state of the output, opposite the actual state of the hardware output. For example, normally, if the output is toggled to On (true), voltage will be set high on the appropriate output. However, if the Invert Output checkbox is checked, when the output is toggled to On (true), zero voltage will be set at the output.
- Accept and Cancel – The Accept and Cancel buttons become highlighted (darkened) whenever a change is made to the information for an I/O point. Before you can configure the next I/O point of the same type, you must either click on Accept or Cancel. If you click on Accept, then the information is temporarily stored for uploading to the **JNIOR**. If you click on Cancel, then your previous set-up is restored. If you forget to click on either Accept or Cancel, a dialogue box will pop-up asking you what you want to do.

4.5 Configuring Analog Inputs

JNIOR has a total of four analog inputs. Each input can be configured independently of the others. To select the desired analog input, use the drop down box at the top of the analog input section. After selecting the desired input, the data in all the boxes will be updated with the current configuration information for that input. If you wish to change the configuration information for that analog input, then change the information in each of the fields for that analog input and click on the “Accept” button. This will save that information into a temporary database. Continue to change the configuration data for all the points, and click on the “Accept” button after each change.

4.5.1 Configuration Field information

- Select Input Number – The drop down menu is used to select the analog input to configure. Your choices are AIN 1 or AIN 2. You first click on the drop down arrow and then click on the analog input number to configure. After you select your desired input, you can make your changes.
- AI Range – The AI Range field is used to select the range of voltage over which the analog input will be valid and scaled. Analog Inputs can be either 0 – 5VDC or 0 – 10VDC, so using the drop down box choose either 0 – 5V or 0 – 10V. With either selection, if the analog input voltage goes over the maximum amount for that range (either 5 or 10 VDC), then an over limit message will be displayed on the Monitor and Control Applet for that analog input.
- Hi Alarm – The Hi Alarm field sets the value at which a high alarm will be triggered. If the analog value exceeds the Hi Alarm set point and the high alarm is enabled, an alarm will be generated and displayed next to the analog units text on the Monitor and Control Applet.
- Lo Alarm – The Lo Alarm field is used to set the value at which a low alarm will be triggered. If the analog value goes below the Lo Alarm set point and the low alarm is enabled, an alarm will be generated and displayed next to the analog units text on the Monitor and Control Applet.

- Units – The Units field is the unit of measure that the analog input is monitoring. For example, gallons per minute (gpm), volts (V), degrees Fahrenheit (deg F), etc. This field can be approximately 10 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet. The units entered do not effect the point measurement or any scaling of the value. It is only for display purposes.
- Scaling – The Scaling field is used to provide a linear scale for the analog input that corresponds to the input voltage and the desired units. This field is entered as two numbers, separated by a comma. The first number represents the value to be displayed on the Monitor and Control Applet if the analog input voltage is 0. The second number represents the value to be displayed on the Monitor and Control Applet if the analog input voltage is the maximum amount (either 5 or 10 V). Any voltage reading in between 0 and the maximum amount is scaled linearly between the Scaling numbers entered.
- Resolution – Used to select the resolution of the Analog Input value. The resolution can be configured for 8, 10, 12 or 16 bit resolutions. Increase the bit resolution to increase the precision of the Analog input voltage measurement. The Analog precision is calculated by dividing the maximum analog input voltage by 2 to the power of the number of bits of resolution. For example, for a 0-10V input, the best precision in 8-bit resolution is 3.9mV (10 divided by 2 to the eighth power or 2^8). The best precision for 16-bit resolution is 0.153 mV (10 divided by 2^{16}).
- Description – The Description field is the text that will be shown on the Monitor and Control Applet for the description of the associated analog input point. This field can be approximately 12 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.
- Hi Alarm Enable – The Hi Alarm Enable checkbox is used to turn Hi Alarming on or off for this particular point. If the box is checked, internal Hi Alarming will be turned on. If the analog value exceeds the Hi Alarm set point, a Hi Alarm flag will become visible next to the input on the Monitor and Control Applet.
- Lo Alarm Enable – The Lo Alarm Enable checkbox is used to turn Lo Alarming on or off for this particular point. If the box is checked, internal Lo Alarming will be turned on. If the analog value goes below the Lo Alarm set point, a Lo Alarm flag will become visible next to the input on the Monitor and Control Applet.
- Enable E-mail of Alarms – The Enable E-mail of Alarms checkbox is used to turn e-mail notification of an alarm condition on or off. If the box is checked, an alarm condition for this point will generate an e-mail to be sent to the e-mail address(es) entered on the Configuration Applet. (See Configuring Communications Settings in Section 4.8 of this manual for entering e-mail address(es)).
- Accept and Cancel – The Accept and Cancel buttons become highlighted (darkened) whenever a change is made to the information for an I/O point. Before you can configure the next I/O point of the same type, you must either click on Accept or Cancel. If you click on Accept, then the information is temporarily stored for uploading to the **JNIOR**. If you click on Cancel, then your previous set-up is restored. If you forget to click on either Accept or Cancel, a dialogue box will pop-up asking you what you want to do.

4.6 Configuring Analog Outputs

There are a total of 2 analog outputs on the **JNIOR**. Each output can be configured independently of the others. To select the desired analog output, use the drop down box at the top of the analog output section. After selecting the desired output, the data in all the boxes will be updated with the current information for the particular output. If you wish to change the configuration information for that output, change the information in each of the fields for that analog output, then click on the "Accept" button. This will save the information into a temporary database. Continue to change the configuration data for all the points, selecting the "Accept" button after each change. The output voltage for an Analog Output is 0 – 10VDC.

4.6.1 Configuration Field information

- Select Output Number – The drop down menu is used to select the analog output to configure. Your choices are AOUT 1 or AOUT 2. You first click on the drop down arrow and then click on the analog output number to configure. After you select your desired output, you can make your changes.
- Units – The Units field is the unit of measure that the analog output is controlling. For example, revolutions per minute (rpm), volts (V), etc. This field can be approximately 10 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet. The units entered do not effect the point measurement or any scaling of the value. It is only for display purposes.
- Scale – The Scale field is used to provide a linear scale for the analog output that corresponds to the output voltage and the desired units. This field is entered as two numbers, separated by a comma. The first number represents the value to be displayed on the Monitor and Control Applet if the analog output voltage is 0. The second number represents the value to be displayed on the Monitor and Control Applet if the analog output voltage is the maximum amount (10 V). Any voltage reading in between 0 and 10V is scaled linearly between the Scaling numbers entered.
- Description field – The description field is the text that will be shown on the monitor applet for the description of the associated analog output point. This field can be approximately 12 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.

- Accept and Cancel – The Accept and Cancel buttons become highlighted (darkened) whenever a change is made to the information for an I/O point. Before you can configure the next I/O point of the same type, you must either click on Accept or Cancel. If you click on Accept, then the information is temporarily stored for uploading to the **JNIOR**. If you click on Cancel, then your previous set-up is restored. If you forget to click on either Accept or Cancel, a dialogue box will pop-up asking you what you want to do.

4.7 Configuring the Temperature Sensor

There is 1 temperature sensor input on the **JNIOR**. If you wish to change the configuration information for the temperature sensor, change the information in each of the fields for the temperature input, then click on the "Accept" button. This will save the configuration information into a temporary database. Continue to change the configuration data for all the points, selecting the "Accept" button after each change.

NOTE: Enabling the temperature sensor input will increase the overall processing time of the JNIOR.

4.7.1 Configuration Field information

- Description - The description field is the text that will be shown on the Monitor and Control applet for the description of the temperature input point. This field can be approximately 12 characters in length, depending on the size of the characters used. If more characters are entered on the Configuration Applet than can be shown in the space on the Monitor and Control Applet, they will not be visible on the Monitor and Control Applet.
- Hi Alarm – The Hi Alarm field is used to set the value at which the Hi Alarm will be triggered. If the temperature exceeds the Hi Alarm set point and the Hi Alarm is enabled, an alarm will be generated and displayed next to the temperature units text on the Monitor and Control Applet.
- Lo Alarm – The Lo Alarm field is used to set the value at which a Lo Alarm will be triggered. If the temperature goes below the Lo Alarm set point and the Lo alarm is enabled, an alarm will be generated and displayed next to the temperature units text on the Monitor and Control Applet.
- Hi Alarm Enable – The Hi Alarm Enable checkbox is used to turn Hi Alarming on or off for this particular point. If the box is checked, Hi Alarming will be turned on, so if the temperature value exceeds the Hi Alarm set point, an Hi Alarm flag will become visible next to the input on the Monitor and Control Applet.
- Lo Alarm Enable – The Lo Alarm Enable checkbox is used to turn Lo Alarming on or off for this particular point. If the box is checked, Lo Alarming will be turned on, so if the temperature value goes below the Lo Alarm set point, a Lo Alarm flag will become visible next to the input on the Monitor and Control Applet.
- Enable E-mail of Alarms – The Enable E-mail of Alarms checkbox is used to turn e-mail notification of an alarm condition on or off. If the box is checked, an alarm condition for this point will generate an e-mail to be sent to the e-mail address(es) entered on the Configuration

Applet. (See Configuring Communications Settings in Section 4.8 of this manual for entering e-mail address(es)).

- Celsius – The Celsius checkbox is used to switch between temperature units for degrees Celsius or degrees Fahrenheit. Temperature units for the Alarms and the default Monitor and Control Applet display are configured by this checkbox. Checking the checkbox sets the temperature units to Celsius. Un-check the checkbox and the temperature units will be configured for degrees Fahrenheit.
- Enable Temperature Sensor – The enable temperature sensor checkbox is used to turn the temperature sensor on. By default, the temperature sensor is TURNED OFF and is NOT being polled by the **JNIOR** and the temperature information is not visible on the Monitor and Control Applet.

***NOTE:** By selecting the enable temperature sensor, the scan time of the **JNIOR** will be increased, reducing the speed at which data is provided to the Monitor and Control Applet and the speed at which all other I/O are polled. Only enable the temperature sensor if it is required and the slower scan time is acceptable. In general, the JNIOR is not intended for time critical applications.*

- Accept and Cancel – The Accept and Cancel buttons become highlighted (darkened) whenever a change is made to the information for an I/O point. Before you can configure the next I/O point of the same type, you must either click on Accept or Cancel. If you click on Accept, then the information is temporarily stored for uploading to the **JNIOR**. If you click on Cancel, then your previous set-up is restored. If you forget to click on either Accept or Cancel, a dialogue box will pop-up asking you what you want to do.

4.8 Configuring Communications Settings

The **JNIOR** is capable of sending e-mail based upon the status of the alarm conditions. The Configuring Communications Settings menu is used for configuring the settings for e-mail alarm notification and for setting the description of the JNIOR as indicated in the top bar of the Monitor and Control Applet.

The screenshot shows a 'Communications' dialog box with the following fields and values:

- E-Mail Delay(sec)**: 10
- E-Mail Repeat**: 5
- E-Mail Address**: alarm@company.com
- Jnior Description**: JNIOR

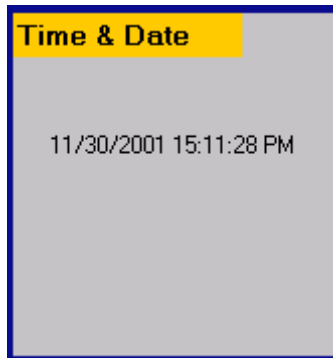
Buttons at the bottom: Accept, Cancel.

4.8.1 Configuration Field information

- **E-mail Delay (sec)** – The E-mail Delay field is the amount of time in seconds that elapses between an alarm event and an e-mail notification being sent (provided the Enable E-mail of Alarms checkbox is checked for that specific I/O point) to the recipient(s) specified in the e-mail address field. This delay can be used to ensure that an I/O point is truly in an alarm condition and not momentarily in alarm. The user is responsible for determining any appropriate delay between detecting an alarm and alarm notification.
- **E-mail Repeat** – The E-mail Repeat field is used to specify the maximum number of E-mail notifications to be sent for each unique alarm. Once an alarm is detected, every x seconds (determined by the E-mail Delay time) an e-mail notification of the alarm will be sent as long as the I/O point remains in alarm up to the value entered in the E-mail Repeat field. If the I/O point goes into alarm, out of alarm and then back into alarm, the E-mail Repeat counter is reset and the e-mail notification will be sent out again up to the number entered in the E-mail Repeat field. Note that setting the repeat to **zero** turns off all e-mail alarms regardless of the state of each e-mail alarm enable checkbox in each section of the configure screen.
- **E-mail Address** – The E-mail Address field is used to specify the E-mail addresses of the recipients of the E-mail notifications. Up to 5 e-mail addresses can be entered, separated by semi-colons.
- **JNIOR Description** – The **JNIOR** Description field is used to enter the name of a specific **JNIOR**. The name will be displayed on the second line of the title bar in the Monitor and Control Applet.

4.9 Real Time Clock and Date

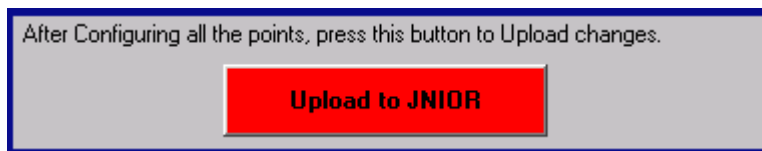
The **JNIOR** has a built in real time clock with date and time. The date and time value is displayed on the Configuration Applet. Date and time values are set using the DATE command in system services.



4.10 Uploading JNIOR Configurations

Configure each **JNIOR** I/O point as desired and click on the "Accept" button to save the changes after each I/O configuration. Press the "Upload to **JNIOR**" button to upload the new configuration information to your **JNIOR**.

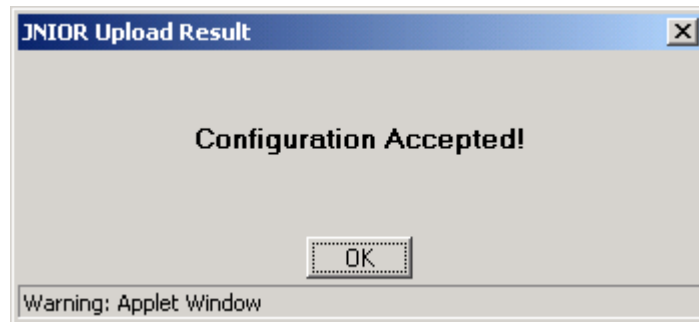
*NOTE: Even though you have clicked on the "Accept" button for each I/O point, the changes that are made using the Configuration Applet are NOT permanent until the "Upload to **JNIOR**" button is selected. Exiting or closing the Configuration Applet prior to clicking on the "Upload to **JNIOR**" button will cause all changes to be lost.*



The Configuration Upload process may take ~60 seconds. A message will be displayed indicating the Upload is in progress.



When the Upload is completed, a dialogue box will pop up indicating that the upload was successful and the configuration is complete. The new configuration settings are automatically updated on the **JNIOR** Monitor and Control Applet.



If you get a communications failure message during the configuration upload, please see section 7.1 for help on troubleshooting the problem.

5 MONITOR AND CONTROL APPLET

The Monitor and Control Applet provides access to the I/O for monitoring the status of the inputs and outputs and for control of the outputs. The status of each I/O point updates approximately once every 1 second. The update rate will be affected by the activation of the internal temperature sensor and the number of e-mail alarms enabled. Network routing delays may also increase refresh delay times even further.

5.1 Accessing the Monitor and Control Applet

The Monitor and Control Applet is accessed via a web browser. In the address line of the browser type:

<http://10.0.0.201/monitor.htm> (or use your customized IP address)

Where 10.0.0.201 is the default IP address of the **JNIOR**

The **JNIOR** Monitor and Control web page login should come up within 15 seconds. Please enter your <username> and <password> and then click the Login button. Upon successful login, the Monitor and Control Applet will be displayed as follows:

JNIOR Monitor & Control
JNIOR

Digital Inputs		Analog Inputs	
Digital In 1	False	Analog In 1	0.1 units
Digital In 2	False	Analog In 2	0.1 units
Digital In 3	False	Analog In 3	0.1 units
Digital In 4	False	Analog In 4	0.1 units

Digital Outputs		Analog Outputs	
Digital Out 1	False	Analog Out 1	2.5 units
Digital Out 2	False	Analog Out 2	0.0 units

Relay Outputs	
Relay Out 1	False
Relay Out 2	False

Counter Inputs		Temperature Input	
Counter In 1	00,000 units	Temperature	73.4 deg F ☐ C
Counter In 2	00,000 units		

Set Output 1: 0.0 0 - 100%
Set Output 2: 0.0 0 - 100%

SN# 36115
05/06/2002 07:59:13 AM
Version 1.21

[Configure Applet](#) | [JNIOR Home Page](#) | [JNIOR Support](#) | [INTEG Home Page](#)

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5.2 Monitor Only vs. Monitor and Control

The **JNIOR** usernames and passwords are configured for privilege levels for the Monitor and Control Applet. The purpose for this is so that some users can access the **JNIOR** and view the status of the I/O without having the authority to change (control) any of the I/O. If the user logs in under the MONITOR ONLY username and password, all of the control buttons (Toggle, Reset and Set Output) on the Monitor and Control Applet will be grayed because they are inactive. If the user logs in under the MONITOR AND CONTROL username and password, all buttons on the Monitor and Control Applet will be bold because they are active.

NOTE: Care should be taken in distributing these usernames and passwords.

5.3 Digital Inputs

The Digital Inputs section is a monitor only section and provides no control functions. The Digital Input description and current status (on/off label) are displayed according to the Configuration settings programmed in the **JNIOR** Configuration Applet.

Digital Inputs		
Digital In 1	False	
Digital In 2	False	
Digital In 3	False	
Digital In 4	False	

If the Digital Input is configured as an alarm point, then a notification will be displayed to the right of the Digital Input status text on the Monitor and Control Applet when it is in alarm.

ALARM

5.4 Digital and Relay Outputs

The Digital and Relay Outputs sections display the current output status and provide control to toggle the output states. The Digital or Relay Output description and status (on/off label) are displayed according to the Configuration settings programmed in the **JNIOR** Configuration Applet. Use the Toggle button to change the output status.

Digital Outputs		
Digital Out 1	False	Toggle
Digital Out 2	False	Toggle
Relay Outputs		
Relay Out 1	False	Toggle
Relay Out 2	False	Toggle

5.5 Counter Inputs

The Counter Inputs section is used to display the current value and to provide a reset for each counter. The Counter Input description, value and units are displayed according to the Configuration settings programmed in the **JNIOR** Configuration Applet. The counter value can be reset to 0 by clicking on the appropriate Reset button.

Counter Inputs		
Counter In 1	00,000	units
Counter In 2	00,000	units
Reset 1		Reset 2

If the Counter Input is configured as an alarm point, then a notification will be displayed to the right of the Counter Input “unit” text on the Monitor and Control Applet when it is in an Alarm 1 or Alarm 2 state.

HI 1 or HI 2

5.6 Analog Inputs

The Analog Inputs section displays the current value of each analog input. The current Analog Input description, value and units are displayed according to the Configuration settings programmed in the **JNIOR** Configuration Applet. This is a monitor only field and provides no control functions.

Analog Inputs		
Analog In 1	0.1	units
Analog In 2	0.0	units
Analog In 3	0.1	units
Analog In 4	0.0	units

If the Analog Input is configured as an alarm point, then a notification will be displayed to the right of the Analog Input “unit” text on the Monitor and Control Applet when it is in a low or high alarm.

LO or HI

5.7 Analog Outputs

The Analog Outputs section allows for the display and control of each analog output. The current Analog Output value is displayed in the upper half of the Analog Output section. The output value may be modified by entering the new value in the lower half of the Analog Output section and pressing the Set Output button. The Analog Output description and units are displayed according to the Configuration settings programmed in the **JNIOR** Configuration Applet.

Analog Outputs		
Analog Out 1	0.0	units
Analog Out 1	0.0	units
Set Output 1	0.0	0 - 100%
Set Output 2	0.0	0 - 100%

5.8 Temperature Input

The **JNIOR** has a built in temperature sensor input display. If the temperature sensor is activated according to the Configuration settings programmed in the **JNIOR** Configuration Applet, then the Temperature section will be displayed on the Monitor and Control Applet in the space below the Analog Outputs and above the Serial Number. The temperature can be displayed in both degrees Fahrenheit and Celsius. Check the C checkbox to display the temperature in degrees Celsius and un-check the checkbox to display the temperature in degrees Fahrenheit.

Temperature Input		
Temperature	73.4	deg F ☐ C

If the Temperature is configured with an alarm point, then a notification will be displayed to the right of the C checkbox on the Monitor and Control Applet when it is in a low or high alarm.

LO or HI

5.9 Real Time Clock

The **JNIOR** has a built in real time clock with date and time. The date and time value is displayed on the Monitor and Control Applet. Date and time values are set using the DATE command in system services.

11/30/2001 14:30:57 PM

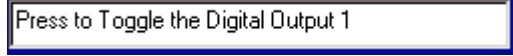
5.10 Serial Number

Each **JNIOR** is assigned a unique serial number. This number can be used to identify each **JNIOR** uniquely and is displayed on the Monitor and Control Applet.

SN#	29655
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5.11 Help Tips Box

The Help Tips Box (located in the area below the Counter Inputs box) displays help tips as the user accesses fields or controls on the Monitor and Control Applet. For example,



Press to Toggle the Digital Output 1

Activity messages are also displayed in the Help Tips Box. For example,



Digital Output 3 Pressed

6 SYSTEM SERVICES

System Services are those features and functions accessible when the user logs into the **JNIOR** at the operating system level. In order to do this, the user 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 2, Getting Started, 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 the user will connect with a Telnet session however connecting with HyperTerminal is also acceptable.

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

6.1 System Services Commands

The **JNIOR** utilizes the operating system (OS) supplied by Dallas Semiconductor for the TINI. This OS utilizes UNIX and MS-DOS like commands for implementing System Services. 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 all of them will not be explained in this User's Manual, only the ones that are required for operation of the **JNIOR**.

```
TINI /> help
Available Commands:

append      arp      cat      cd
chmod       chown   clear    copy
cp          date    del      df
dir         downserver  echo     ftp
gc          genlog  help     history
hostname    ipconfig  java     kill
ls          md      mkdir    move
mv          netstat  nslookup  passwd
ping       ps      pwd      rd
reboot     rm      rmdir    sendmail
setenv     source  startserver  stats
stopserver su      touch    useradd
userdel    wall    wd        who
whoami

TINI />
```

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

The only commands needed by the user of the **JNIOR** are `ipconfig`, `date` and several directory commands for software upgrades. The `ipconfig` command will not be explained again in this section. Please see Section 2, Getting Started.

6.2 Setting Date and Time

The date and time can be set on the **JNIOR** at the System Services level. The date and time are based on an internal Real Time clock that can be set to Greenwich Mean Time with an appropriate time zone entered or can be set with the current time of the time zone in which the **JNIOR** is being used. The time is preset from the factory as Eastern Standard Time (EST) for the United States and will require resetting if the **JNIOR** is being used in a different time zone. The date and time can be set using the `date` command.

The following displays all of the instructions for using the `date`. However, it is suggested that the easiest way to set the date is to just type in the date and time of your current location and not include any offset to Greenwich Mean Time (GMT). Therefore, to enter the date as November 30, 2001 with a time of 4:30 pm, the user would enter on the command line the following:

TINI /> `date 11302001043000pm`

```
TINI /> help date
date [option] [MMDDYYYYHHMMSS] [timezone]

Display or set system time information.
Where options include:
[-t] Display valid timezones.
Setting the date must be in the form of: MMDDYYYYHHMMSS<am | pm> [timezone]

Example: to set March 17, 2001 3:35:23
date 03172001033523pm OR date 03172001153523

Example: to set April 5 in Central Standard time
date 0405 CST

Example: to just set timezone to Pacific Standard
date PST

Example: to set the timezone to an offset from GMT
date +10

Note that you can specify an offset only in hours for the timezone.
date +10 OR date 10202000102630 -6
This could be useful for locations that might use a Time Zone like CST
but do not use Daylight Savings Time.
TINI /> _
```

6.3 File System

The **JNIOR** contains a file system in memory that can be accessed from the command line. The user does NOT need to access any specific files to utilize or configure the **JNIOR**.

Custom software development can be done on the desktop with standard software development tools for developing web pages (HTML) and Java code. Customizing the web pages for the customer's needs are easily done by downloading the standard web pages supplied with the **JNIOR** and then editing them with a product such as Microsoft Front Page. However, the user must be careful not to change the handling of the Applet or the **JNIOR** will become inaccessible via your web browser.

Customization of the Monitor and Control Applet and Configuration Applet is possible, but requires additional information and authorization from INTEG process group. Please contact INTEG at sales@integpg.com should you be interested in this feature.

The other reason to access the file directory system would be to download software upgrades supplied by INTEG (See Section 6.4).

!WARNING – Modifying or changing files or file structure may render your **JNIOR** inoperative. Please consult INTEG process group, inc. prior to making file changes.

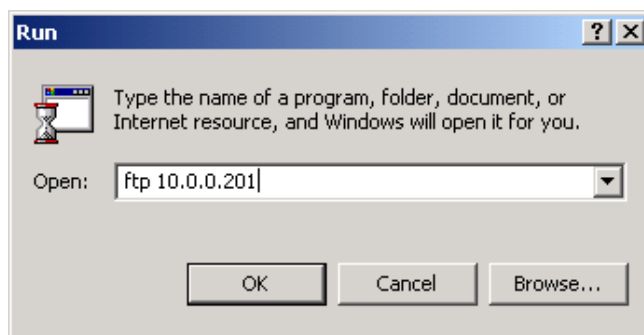
6.3.1 File Transfer Protocol (FTP)

The **JNIOR** contains a File Transfer Protocol (FTP) server for moving files to or from the **JNIOR** and your PC. There are basic FTP packages supplied with most Windows operating systems and several other packages available.

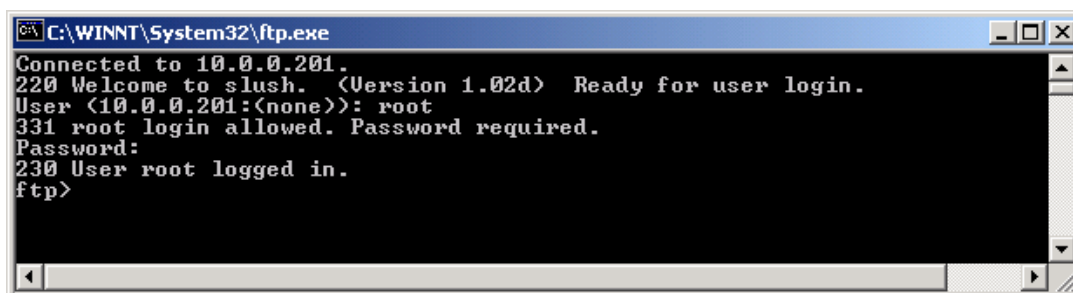
If you want to transfer a file from the **JNIOR** for editing (such as one of the HTML files for the Home, Monitor and Control or Configure web page), then you would do it using FTP. This User's Manual will not go into detail on how to do all of this, but will provide some of the basic instructions for transferring a file with FTP. If a software upgrade is to be provided by INTEG process group, then directions will be provided on how to use FTP or INTEG will supply a software upgrade wizard.

An FTP session is started by using the Start, then Run command on a Windows based PC. When the Run dialogue box comes up, type in FTP and the IP address of the **JNIOR**. If your **JNIOR** is still set to the factory set IP address, then you would type in `ftp 10.0.0.201`.

Your computer screen should look as follows:



After you click okay, you are connected to the **JNIOR** via FTP and a MS-DOS like window will be open, enter your <username> and <password> for System Services supplied with your **JNIOR**. Your computer screen should look as follows:



Typing **help** at the command line will display a list of the commands available to you with FTP. The primary commands to be used are **cd**, which will change the directory you are in, **dir**, which will list the files in the current directory, **get**, which will transfer a file from the **JNIOR** to your PC and **put**, which will transfer a file from your PC to the **JNIOR**.

So, if you were to go to the directory with the web pages, you would type **cd www** on the command line and then type **dir** on the command line. Your computer screen should look as follows:

```

C:\WINNT\System32\ftp.exe
ftp> cd www
250 CWD command successful.
ftp> dir
200 Command successful.
150 Opening ASCII mode data connection for file list.
total 7
drwx--r--  1 128      admin      5 Dec 06 12:10 .
drwx--r-x  1        admin      8 Dec 06 11:46 ..
-rwx--r--  1        admin 55952 Dec 17 10:57 JniorAApplets.jar
-rwx--r--  1        admin 4924 Dec 06 12:13 integ_logo_modified.gif
-rwx--r--  1        admin 8981 Dec 06 12:12 index.html
-rwx--r--  1        admin 3921 Dec 06 12:12 configure.htm
-rwx--r--  1        admin 3940 Dec 06 12:12 monitor.htm
226 Closing data connection.
ftp: 478 bytes received in 2.52Seconds 0.19Kbytes/sec.
ftp>
ftp>

```

The **JNIOR** Home Page is in the file identified as **index.html**, the Monitor and Control web page is in the file identified as **monitor.htm**, and the Configuration web page is in the file identified as **configure.htm**. Using FTP to “get” these files from the **JNIOR**, modifying them with a web page software development package and then using FTP to “put” them back on the **JNIOR** will allow you to customize your web pages. Any graphics, such as logos, used by the web pages would also need to “put” into this directory.

*NOTE: The user must be careful not to change the handling of the Applet by the various web pages or the **JNIOR** will become inaccessible via your web browser.*

The Applets used for the Monitor and Control Applet and the Configuration Applet are packaged in the **JniorAApplets.jar** file. This file does not contain any source code so you are unable to modify the Applets. Please contact INTEG process group to discuss how the Applets can be modified.

When finished with your FTP session, type **bye** on the command line to end your session.

6.4 Software Upgrades and User's Manual Updates

As software upgrades become available for the **JNIOR**, upgrades can be downloaded from the INTEG **JNIOR** Support web site. The **JNIOR** Support website is accessible via a link at the bottom of each **JNIOR** web page (Home Page, Monitor and Control page and Configuration page) and is identified as “**JNIOR** Support”. This page is not accessible as a link from the INTEG process group website. Please contact INTEG if you are unable to access this site from your **JNIOR**.

[Monitor Applet](#) | [Configure Applet](#) | [JNIOR Support](#) | [INTEG Home Page](#)

Download the software upgrade and follow the upgrade instructions provided with the upgrade to properly upgrade the **JNIOR** software.

Updates to the User's Manual and a list of Frequently Asked Questions are also available from the **JNIOR** Support website.

7 TROUBLESHOOTING

The **JNIOR** is designed to be simple and robust with minimum configuration and no software development required when used in its basic form. Therefore, the majority of the troubleshooting encountered with the operation of the **JNIOR** will be either a communication failure or wiring problem.

7.1 Communication Failure

If the **JNIOR** is not accessible when first connected to your network or computer by typing its IP address into your web browser address line, then please check the IP configuration and see Section 2 for proper set-up. Check with your network administrator (if one is available) for the proper IP configuration settings. Internet Explorer will put up a web page starting with the following:



The page cannot be displayed

The page you are looking for is currently unavailable. The Web site might be experiencing technical difficulties, or you may need to adjust your browser settings.

If the main **JNIOR** web page launches when you type its IP address into your web browser address line and you can select either the Monitor and Control Applet or the Configuration Applet and that web page launches, but the Applet does not launch and instead you get the following message:

JNIOR Connection Failed!

Could not establish connection to the designated JNIOR

The port that is being used to connect to the Applet for transmitting dynamic data is being blocked. This port can be blocked by a firewall, router, etc. that prohibits the program from binding to that specific port. You will have to either reconfigure the **JNIOR** to utilize a different port (see section 2.4.4) or ask your network administrator to open your desired port.

If you are able to connect to the Monitor and Control Applet or Configuration Applet and the Login box is displayed, then you have successfully connected to the **JNIOR** via the proper IP address and the port for the dynamic data packets is accessible. However, if after 10-15 seconds (and possibly even after you type in your Username and Password), you get the following message:

JNIOR Communications Failed!

Connection to the designated JNIOR was lost

This situation and failure is most likely caused by a missing I/O map file. The I/O map file defines for the **JNIOR** the function of each 1-Wire chip being used for the **JNIOR** I/O. Without this file, the **JNIOR** cannot operate and the main program stops running breaking the connection between your web browser and **JNIOR**. Upon boot-up, if the I/O map file is missing, the **JNIOR** will create a temporary one, but this will still not allow the **JNIOR** to operate and communicate properly. This temporary file must be verified by the user and renamed. Section 9.2 describes how to rebuild your I/O map file.

Once communication has been established with the **JNIOR**, if communications should ever fail with the **JNIOR** while a **JNIOR** web page/Applet is being viewed, the following message will be displayed:



This failure can be caused by the network failing, the power to the **JNIOR** being lost or a failure of the **JNIOR**. Each of these options should be investigated.

Once initial communication with the **JNIOR** has been established indicating proper set-up, and the **JNIOR** is not accessible by entering the its IP address in the address line of your web browser at some future time, you will get a notice from your web browser saying this web page is not available.



The page cannot be displayed

The page you are looking for is currently unavailable. The Web site might be experiencing technical difficulties, or you may need to adjust your browser settings.

This failure can be caused by the network failing, the power to the **JNIOR** being lost or a failure of the **JNIOR**. Each of these options should be investigated.

7.2 Wiring Problem

Troubleshooting wiring problems for each individual application of the **JNIOR** will be the responsibility of the user. The one common item to verify is that the input voltage is available and between 7 and 30 V DC or AC (the red power light will be on when power is available).

The other issue that should be checked is that the power connected to each I/O point meets the specifications outlined in Section 1.3, Specifications. Also, many of the same type inputs share a common ground.

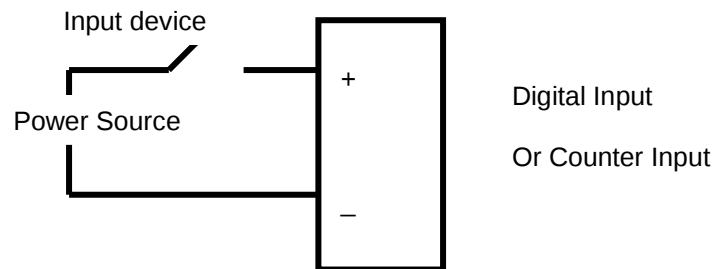
8 I/O CONNECTIONS

The **JNIOR** I/O is designed to be connected to low voltages in the range of 5 – 30 V AC or DC. If your application utilizes higher voltages or larger currents, then the use of interpose relays, transmitters, signal conditioners, etc. will be required to isolate the **JNIOR** I/O from the higher voltages. Please contact a certified electrician if you need assistance.

The following is some basic connection information for the various I/O points.

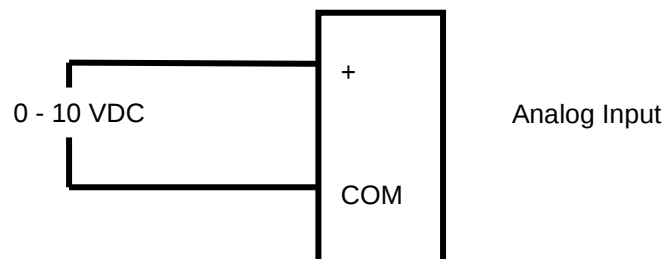
8.1 Digital and Counter Inputs

The **JNIOR** is equipped with four (4) optically isolated digital inputs and two (2) optically isolated counter inputs. Each input can accept AC or DC voltage sources in the 5 – 30 V range. A typical connection would look as follows:



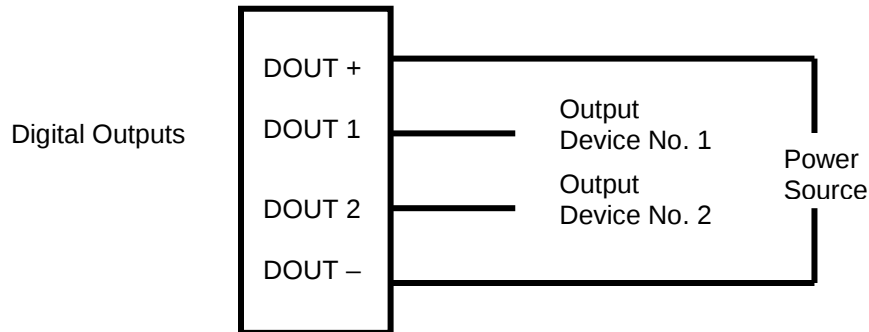
8.2 Analog Inputs

The **JNIOR** is equipped with four (4) analog inputs. Each input can accept 0 – 5V or 0 – 10V DC voltage. A typical connection would look as follows:



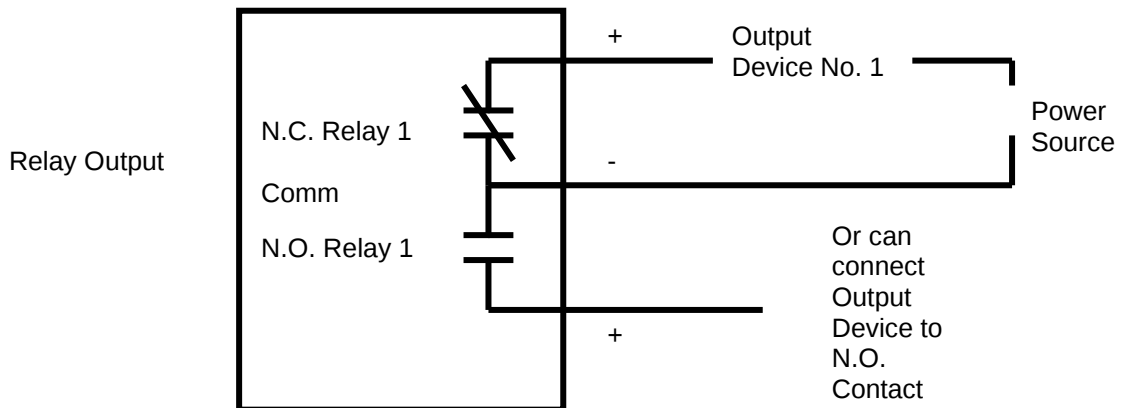
8.3 Digital Outputs

The **JNIOR** is equipped with two (2) digital outputs. Each digital output is optically isolated and capable of switching voltage sources of 5 – 30VDC @ 1A. The digital outputs share a common power source. A typical connection would look as follows:



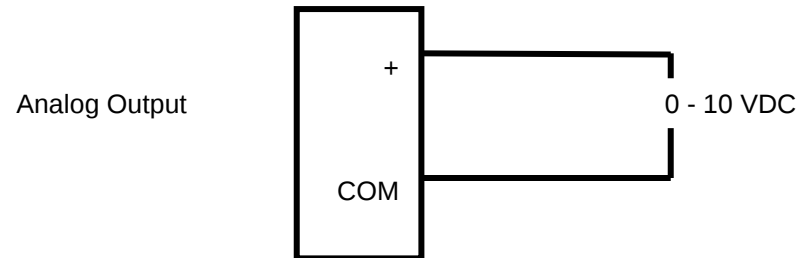
8.4 Relay Outputs

The **JNIOR** is equipped with two (2) relay outputs. Each relay output is a Form C SPDT relay contact providing Normally Open (N.O.) and Normally Closed (N.C.) contacts with a Common wire. A typical connection would look as follows:



8.5 Analog Outputs

The **JNIOR** is equipped with two (2) analog outputs. Each output is capable of providing 0 – 10 VDC @ 10mA output. A typical connection would look as follows:



9 ADVANCED

Topics in this section of the User Manual are for advanced **JNIOR** procedures and operations not required under normal operating circumstances.

9.1 Configuring an External Temperature Sensor

The **JNIOR** can be optionally configured to use an external temperature sensor that is connected via the **JNIOR** 1-Wire Extension port. The temperature sensor must be a Dallas Semiconductor 1-Wire™ Temperature Sensor (DS18S20). To connect an external temperature sensor first disable the built-in temperature sensor and then modify the **JNIOR** I/O Map file to point to the correct temperature sensor address. Perform the following to disable the built-in temperature sensor:

1. Remove the cover from the **JNIOR** by removing the 4 lid screws on the faceplate.
2. Locate the jumper J100 on the **JNIOR** printed circuit board.
3. Remove the jumper from the header pins.
4. Place the jumper on only 1 of the header pins on J100. This is only so that the jumper will not be lost for future use.
5. Replace the **JNIOR** cover and secure with the 4 lid screws.

To correct the I/O Map file follow the ADVANCED instructions in the Restoring or Modifying the **JNIOR** I/O Map section. This process can be expedited if a back-up copy of the current I/O Map file is used as a reference for modifying the new I/O Map file. Use the back-up copy of the current I/O Map file to match the correct function with the I/O device address. This will eliminate the need to use the process of elimination since only the temperature input function needs to be updated with a new device address.

9.2 JNIOR Software Restoration

In the event that the **JNIOR** file system is lost or corrupted, the **JNIOR** software is restored by following the instructions below. Some knowledge of Telnet, FTP and System Services is helpful. Your **JNIOR** User's Manual provides some of the basic instructions for using these features.

All files necessary to restore the **JNIOR** are contained on your **JNIOR** Software CD. To restore your **JNIOR** software, perform the following:

1. Extract the **JNIOR** software files from the **JNIOR** Software CD to a folder (directory) on your Windows-based PC.
2. Establish a Telnet connection to the **JNIOR** and login using a System Services (admin privilege level) username and password. *NOTE: In the event you also lost the password file stored on your **JNIOR**, then the TINI controller will automatically default to its factory set usernames and passwords of U> jnior and P> jnior. After you have reinstalled your software, it is recommended you modify the "jnior" password and/or create new user accounts.*
3. Create a directory on your **JNIOR** in the root (or main) directory called "www". This is done using the System Services command **md** and typing **md www** at the command line.
4. Establish an FTP connection to the **JNIOR** and login using your System Services account.
5. Use the FTP **put** command to place the following files into the appropriate directories:
NOTE: Use the **cd** and **lcd** commands to set the directories your are "getting" the software from and/or "putting" the software to (i.e source and destination must be the active directories).

<u>Directory</u>	<u>JNIOR pkg filename</u>	<u>Filename</u>
/	"jnior.tini"	"jnior.tini"
/	"iomap.txt"	"iomap.txt" **

/www	"monitor.htm"	"monitor.htm"
/www	"configure.htm"	"configure.htm"
/www	"index.html"	"index.html"
/www	"JniorConfigApplet.jar"	"JniorConfigApplet.jar"
/www	"JniorMonApplet.jar"	"JniorMonApplet.jar"
/www	"integ_logo_modified.gif"	"integ_logo_modified.gif"

****Note:** The iomap.txt file is unique to each **JNIOR** and is not provided on the **JNIOR** Software CD. Without a correct iomap.txt file the **JNIOR** will not function properly. It is required that you make a backup of this file initially prior to putting the **JNIOR** product into service. If a backup is not available the iomap.txt file can be restored. Reference the Restoring/Modifying the **JNIOR** IOMap guide.

6. Close the FTP and Telnet sessions to the **JNIOR**.
7. Reboot the **JNIOR** by cycling the power off for ~5 seconds.
8. Wait approximately 30 seconds for the **JNIOR** to reboot.
9. Using a web browser connect to the **JNIOR** and run the configuration applet.
10. Reconfigure your **JNIOR** product as desired.

NOTE: Once your **JNIOR** has been configured, the configuration may be saved for future restoration. The **JNIOR** configuration is saved in the file system as "ioconfig.txt" in the root directory. Using the FTP utility [get](#), the ioconfig.txt file can be saved to your PC. For future restorations, the ioconfig.txt file may be restored following the above procedure. This may aid in reducing configuration effort (Step 10 above).

9.3 Restoring or Modifying the JNIOR I/O Map

In the event that the **JNIOR** file system is corrupt, destroyed, or the iomap.txt file removed and a backup copy of the **JNIOR** iomap.txt file is not available, please follow the instructions below to recreate the **JNIOR**'s iomap.txt file. These instructions are valid for the standard **JNIOR** I/O configuration only.

CAUTION: The **JNIOR** will create a temporary iomap.txt file in the root directory during initialization (boot-up) if an iomap.txt file cannot be found in the root directory. This temporary iomap.txt file may be incorrect and result in improperly functioning **JNIOR** I/O. The following steps must be completed to verify the I/O map configuration.

NOTE: If you are uncomfortable or unable to complete the following steps, please return your **JNIOR** to INTEG and we will be glad to restore your I/O map for you and return your **JNIOR** with a new iomap.txt file plus a back-up copy on a floppy disk.

The following is an example of an iomap.txt file.

Example iomap.txt file:

```
# ----- JNIOR I/O Map File -----
#iomap file for JNIOR S/N: XXXXX
[iomap file]
D70000000165C520, ai1234
6A000800185A0510, ti1
3800000002963E2C, ao1
C00000000299B22C, ao2
CB00000020A1D012, di12
1D00000020A18B12, di34
E500000020A18012, do12
4F00000020A04B12, ry12
32000000043D8C1D, ci12
# ----- End of JNIOR I/O Map Listing -----
```

Where the **JNIOR** I/O Function Designators represent the following I/O points on a standard **JNIOR**.

I/O Function Designator	I/O Description
ai1234	Analog Inputs 1, 2, 3 and 4
ao1	Analog Output 1
ao2	Analog Output 2
di12	Digital Input 1 and 2
d34	Digital Input 3 and 4
do12	Digital Output 1 and 2
ry12	Relay Output 1 and 2
ci12	Counter Input 1 and 2
ti1	Temperature Input 1 **

** This Input is optional and may not be present

The **JNIOR** utilizes a series of smart chips (1-Wire® chips from Dallas Semiconductor) for its I/O. These chips are connected internally on the **JNIOR** via a 1-Wire Network (or externally via the 1-Wire expansion port). In order for the **JNIOR** to properly work, it must maintain a list of all of the available 1-Wire chips on the network and associate that chip with a specific I/O point. The **JNIOR** reads the 1-Wire chip addresses (a unique number for each chip) and knows from the address what type of I/O point it is and can make a first attempt at assigning it to a specific I/O point. But since there are multiples of the same

types of chips, the **JNIOR** cannot be certain that it has matched the correct chip address to the expected I/O point. For example, there are two analog output chips (one analog output per chip) and it must determine which chip is Analog Output 1 and which chip is Analog Output 2. The same situation occurs with the digital chips, but to a greater extent because there are 4 chips that look the same based on their address, but each must be resolved as a Digital Input, Digital Output or Relay Output.

Upon initialization (boot-up) of the **JNIOR**, a temporary iomap.txt file is created if one does not already exist. (The **JNIOR** does not develop one each time it boots, only when one is not available.) The temporary iomap.txt file is a listing of all available I/O, but the **JNIOR** I/O Function Designator and 8 Byte Address may not be properly matched for the digital inputs, digital outputs, relay outputs and analog outputs.

When a new, temporary I/O map is created (or it is suspected that the existing I/O map is incorrect or damaged), the user must perform the following steps to correct the I/O map and restore proper I/O function:

1. Establish a Telnet connection to the **JNIOR** and login using a System Services (admin privilege level) username and password.
2. If an iomap.txt file exists in the root directory and it is suspected as being damaged or incorrect, then remove it by deleting this file.
3. Reboot the **JNIOR** (your Telnet session will be lost) and a temporary I/O map file will be created.
4. Re-establish a Telnet connection to the **JNIOR** and login using a System Services (admin privilege level) username and password.
5. Rename the temporary iomap file, change it from "iomap.txt.tmp" file to "iomap.txt" file.
6. FTP the iomap.txt file to a local working directory on your PC so that you will be able to edit it as required.
7. Reboot the **JNIOR** so that it will use the temporary iomap file it created. You will then be able to run some tests to resolve the correct matching of the **JNIOR** I/O Function Designator and 8 Byte Address.
8. Wait about 60 seconds for the **JNIOR** to reboot and then open the **JNIOR** Monitor and Control Applet and Login.
9. Open the copy of the iomap.txt file (that you moved to your PC in Step 6) in a text editor program of your choice (such as WordPad or Notepad) so that you are ready to edit it as necessary.
10. On the Monitor and Control Applet, set Analog Output 1 to 100%.
11. Using a voltmeter, measure the Analog Output 1 voltage across AOUT1+ and COM.
12. If the output voltage is ~10VDC then the iomap for the Analog Outputs is correct, if not, then move the ao1's **JNIOR** I/O Function Designator ("ao1") to the ao2's 8 Byte Address and move ao2's **JNIOR** I/O Function Designator ("ao2") to ao1's 8 Byte Address in the iomap.txt file using your text editor.
13. Save the iomap.txt file.
14. Using a process of elimination, as follows, you can correct the iomap.txt file for the Digital Inputs, Digital Outputs and Relay Outputs.
 - "Toggle" (using the Monitor and Control Applet) one of the Digital or Relay Outputs or "drive" (connect a voltage source) one of the Digital Inputs. If the Input or Output functions are correct (the LED will be illuminated on the correct Output OR the Monitor and Control Applet will display that the correct input was "driven") then the I/O map for that function is correct. If not, then the I/O map for that function is incorrect and the **JNIOR** I/O Function Designator will have to be swapped with one of the other digital inputs or outputs in the iomap.txt file.
 - o **NOTE:** Reference the Process of Elimination Hints at the end of this document for additional help.
 - Save the modified iomap.txt file.
 - To test your corrected I/O map, you must FTP the iomap.txt file from the local PC to the root directory of the **JNIOR**. However, you may try to resolve several of the digital inputs or digital outputs or relay outputs at once before uploading your corrected iomap.txt file to the **JNIOR**.
 - Reboot the **JNIOR**.

- Wait for the **JNIOR** to reboot and then open the **JNIOR** Monitor and Control Applet and Login.
 - Test your changes.
 - Continue with the process of elimination until all Digital Inputs and Digital Outputs and Relay Outputs function properly.
15. Once the iomap file has been resolved, save a backup copy for future restoration if necessary.

Process of Elimination Hints

The iomap.txt file lines that begin with a “#” symbol are lines that are remarked out (comment lines) that do not affect the iomap.txt file operation. The iomap.txt file entries begin with an 8 Byte Address (64 bit) with a comma and a space separating the **JNIOR** I/O Function Designator.

It does not matter the order of the addresses/designator in the iomap.txt file. So, when editing the iomap.txt file, it does not matter whether the **JNIOR** I/O Function Designator is changed or the 8 Byte Address is changed. It is recommended that you do NOT “paste” over or delete an 8 Byte Address without first printing your file or writing down the list of addresses first. You cannot re-create these addresses without first deleting the current iomap.txt file and rebooting the **JNIOR** (steps 2 and 3 above).

To reduce the number of iterations required, attempt to resolve more than one I/O function designator and address per iteration. Typically it is easiest to first resolve the Relay Outputs, Digital Outputs and Analog Outputs and then the Digital Inputs.

If you toggle Relay Output 1 and Digital Output 1 LED illuminates then exchange the **JNIOR** I/O Function Designator ry12 with that of do12. Or if you toggle Digital Output 1 and the Relay Output 1 LED illuminates then exchange the **JNIOR** I/O Function Designator do12 with that of ry12. If you toggle Relay Output 1 and no LED illuminates then the current address for ry12 is a Digital Input either di12 or di34. If you toggle Digital Output 1 and no LED illuminates then the current address for do12 is a Digital Input either di12 or di34.

“Drive” (apply power to) Digital Input 1 and if Digital Input 3 shows the true label at the Monitor and Control Applet then exchange the **JNIOR** I/O Function Designator di34 with that of di12. Or if you “drive” Digital Input 3 and Digital Input 1 shows the true label at the Monitor and Control Applet then exchange the **JNIOR** I/O Function Designator di12 with that of di34. If the Digital Input is driven and the LED is illuminated but no Digital Input state changes at the **JNIOR** Monitor and Control Applet then the address for that function is a Digital Output or Relay Output function (do12 or ry12).