

Digital IO

- Digital IO, on page 1
- Configure and manage alarms on the router, on page 2
- Configure additional parameters on the router, on page 2
- Configuration and verification examples, on page 3

Digital IO

Digital I/O provides a configurable input or output connection on the IR1000 Series Rugged Router.

Unlike the dedicated ALARM IN and ALARM OUT connections on IE switches and IR routers, a Digital I/O channel can be configured as either an input or an output.

ALARM OUT uses a relay to provide Normally Open (NO) or Normally Closed (NC) terminals; Digital I/O does not include a relay.

The IR1000 Rugged Series Secure Routers supports one Digital I/O channel and one return connection. The channel shares the front-panel 4-pin Terminal Block Receptacle with the power entry. Secure the 4-pin Terminal Block Plug to the receptacle using its screws.

Dry contact

In a dry-contact application, set the channel output to 0 to keep the NPN transistor off.

- When the external contact is open, the input is approximately 3.3 V.
- When the external contact is closed, the input is approximately 0.4 V.
- An input greater than 2.64 V is read as 1.
- An input less than 0.66 V is read as 0.

Wet contact

In a wet-contact application, set the channel output to 1 to turn on the NPN transistor. The external voltage must be greater than 3.3 V.

- When the external contact is open, the input is approximately 0.49 V (0.01 V + 0.08 V + 0.4 V), which is read as 0.
- When the external contact is closed, the input is approximately 3.3 V, which is read as 1.

- An input less than 0.66 V is read as 0; an input greater than 2.64 V is read as 1.

Configure and manage alarms on the router

Before you begin

Familiarize yourself with the IR1000 alarm ports and their locations:

- Alarm contact 1 is located in the base unit and operates in Input/Output Mode.

Set up and customize alarm configurations on the IR1000 router using the CLI.

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Router#configure terminal
```

Step 2 Enable an alarm contact by specifying its contact number 1.

Example:

```
Router#alarm contact 1 enable
```

Step 3 Configure additional parameters such as application mode, description, output state, severity and trigger condition.

See Configure additional parameters on the router, on page 2.

Step 4 Exit the global configuration mode.

Example:

```
Router#end
```

Step 5 (Optional) Save the configuration to the startup configuration file.

Example:

```
Router#copy running-config startup-config
```

Configure additional parameters on the router

The purpose of this task is to configure and customize alarm contact parameters on the router to ensure proper monitoring and alerting functionality. This includes setting the application mode, providing descriptive information, defining output states, assigning severity levels, establishing threshold values, and specifying trigger conditions for alarm contact 1.

Procedure

Step 1 Set the application mode for alarmcontact 1 with **alarm contact 1 application {dry | wet}** command.

- **dry**: Default application mode.
- **wet**: Alternate application mode.

Example:

```
Router#alarm contact 1 application dry
```

Step 2 Add a description of up to 80 alphanumeric characters with **alarm contact contact-number description <description>** command.

Example:

```
Router#alarm contact 1 description test
```

Step 3 Specify the output state for alarm contact 1 with **alarm contact 1 output {1 | 0}** command.

- **1**: High state
- **0**: Low state

Example:

```
Router#alarm contact 1 output 1
```

Step 4 Define the severity level with **alarm contact 1 severity {critical | major | minor | none}** command.

Example:

```
Router#alarm contact 1 severity minor
```

Default severity: **minor**

Step 5 Configure the trigger condition with **alarm contact 1 trigger {closed | open}** command.

Example:

```
Router#alarm contact 1 trigger closed
```

Configuration and verification examples

Alarm contacts in the IR1001 router are configurable monitoring elements that generate system messages when triggered. They allow you to monitor the status and respond to events.

Configuration example

```
Router#conf terminal
Enter configuration commands, one per line.   End with CNTL/Z.
Router(config)#alarm contact 1 description

Your Descriptive Text Here
Router#(config)#alarm contact 1 severity critical
```

```
Router(config)#alarm contact 1 trigger closed
```

Verification example

```
Router#show alarm
Alarm contact 1:
Enabled: Yes
Status: Not Asserted
Application: Dry
Description: test
Severity: Critical
Trigger: Open
```

Example of an alarm being generated:

```
Router#show alarm
Digital I/O 1:
Enabled: Yes
Status: Asserted
Application: Dry
Description: External digital I/O port 1
Severity: Critical
Trigger: Closed
```

Example of an alarm being asserted:

```
Router#
*Nov 12 16:15:18.625 UTC: %IIOT_ALARM_CONTACT-5-EXTERNAL_ALARM_CONTACT_ASSERT_MINOR: External
 alarm/digital IO port (External digital I/O port 1) asserted
```

Example of an alarm being cleared:

```
Router#
*Nov 12 16:14:23.174 UTC: %IIOT_ALARM_CONTACT-2-EXTERNAL_ALARM_CONTACT_CLEAR_CRITICAL:
External alarm/digital IO port (External digital I/O port 1) cleared
```