

4.4.4 Digital I/O, Alarm and Event Command Set

Command Syntax	Command Name	Description	I/O Module
@AADI	Read Digital I/O and Alarm Status	The addressed module returns the state of its digital input and digital output channels and the status of its alarm	4011, 4011D, 4012, 4014D, 4016
@AADO(data)	Set Digital Output Values	Set the values of the module's digital outputs (ON or OFF)	4011, 4011D, 4012, 4014D, 4016
@AAEAT	Enable Alarm	Enables the alarm in either Momentary or Latching mode	4011, 4011D, 4012, 4014D, 4016
@AAHI(data)	Set High Alarm Value	Downloads the High alarm limit value	4011, 4011D, 4012, 4014D, 4016
@AALO(data)	Set Low Alarm Value	Downloads the Low alarm limit value	4011, 4011D, 4012, 4014D, 4016
@AADA	Disable Alarm	Disables all alarm functions	4011, 4011D, 4012, 4014D, 4016
@AACA	Clear Latch Alarm	Resets the module's Latch alarm to zero	4011, 4011D, 4012, 4014D, 4016
@AARH	Read High Alarm Value	Ask the addressed module to return its high alarm value	4011, 4011D, 4012, 4014D, 4016
@AARL	Read Low Alarm Value	Ask the addressed module to return its low alarm value	4011, 4011D, 4012, 4014D, 4016
@AARE	Read Event Counter	Ask the addressed module to return its event counter value	4011, 4011D, 4012, 4014D
@AACE	Clear Event Counter	Reset the module's event counter to zero	4011, 4011D, 4012, 4014D

@AADI

Name	Read Digital I/O and Alarm State
Description	The addressed analog input module is instructed to return the value of its digital input and output channels and the state of its alarm (Momentary or Latching).
Syntax	<p>@AADI(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>DI is the Read Digital I/O and Alarm Status command.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AASOOI(cr) if the command was valid (ADAM-4011/4011D/4012/4014D).</p> <p>!AASOO00(cr) if the command was valid (ADAM-4016)</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>S hexadecimal number that represents the alarm state (0h = disabled, 1h = MOMENTARY mode enabled, 2h = LATCH mode enabled).</p> <p>OO (for ADAM-4011/4011D/4012/4014D) is a hexadecimal number representing the Digital Output port's channel 0 and 1 status (00h = D/O channels 0 and 1 are both OFF, 01h = channel 0 is ON, channel 1 is OFF, 02h = channel 0 is OFF, channel 1 is ON, 03h = channel 0 and 1 are both ON).</p>

@AADI

OO (for ADAM-4016) is a hexadecimal number representing the status of the four digital output channels. The corresponding table is shown in the following table:

Status Code	D00	D01	D02	D03
00	OFF	OFF	OFF	OFF
01	OFF	OFF	OFF	ON
02	OFF	OFF	ON	OFF
03	OFF	OFF	ON	ON
04	OFF	ON	OFF	OFF
05	OFF	ON	OFF	ON
06	OFF	ON	ON	OFF
07	OFF	ON	ON	ON
08	ON	OFF	OFF	OFF
09	ON	OFF	OFF	ON
0A	ON	OFF	ON	OFF
0B	ON	OFF	ON	ON
0C	ON	ON	OFF	OFF
0D	ON	ON	OFF	ON
0E	ON	ON	ON	OFF
0F	ON	ON	ON	ON

II is a hexadecimal number representing the Digital input port's channel status (00h = D/I channel is Low, 01h = channel is High).

(cr) represents terminating character, carriage return (0Dh).

Example

command: @15DI(cr)

response: !510001(cr)

The analog input module at address 15h is instructed to return digital I/O data and alarm status.

The module responds that both digital output channels are OFF, digital input is HIGH, and alarm state is Momentary.

@AADO

Name	Set Digital Output
Description	Sets the values of the module's digital outputs (ON or OFF).
Syntax	<p>@AADO(data)(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>DO is the Set Digital Output command</p> <p>(data) is the two-character parameter that sets the state for the digital output bits of the module, as shown below:</p> <p>ADAM-4011/4011D/4012/4014D:</p> <p>00 all D/O bits are OFF</p> <p>01 DO0 is ON, DO1 is OFF</p> <p>02 DO0 is OFF, DO1 is ON</p> <p>03 all bits are ON</p> <p>ADAM-4016:</p> <p>00 DO0 and DO1 are OFF</p> <p>01 DO0 is ON, DO1 is OFF</p> <p>02 DO0 is OFF, DO1 is ON</p> <p>03 DO0 and DO1 are ON</p> <p>10 DO2 and DO3 are OFF</p> <p>11 DO2 is ON, DO3 is OFF</p> <p>12 DO2 is OFF, DO3 is ON</p> <p>13 DO2 and DO3 are ON</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(cr) if the command was valid.</p> <p>?AA(cr) if an invalid parameter was entered.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist</p> <p>!delimiter character indicating a valid command was received.</p> <p>?delimiter character indicating the command was invalid.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>

@AADO**Example**

command: @05DO01(cr)

response: !05(cr)

The analog input module at address 05h is instructed to set digital output channel 1 to ON and digital output channel 2 to OFF. The module confirms the settings.

@AAEAT

Name	Enable Alarm
Description	The addressed analog input module is instructed to enable its alarm in either Latching or Momentary mode.
Syntax	<p>@AAEAT(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>EA is the Enable Alarm command.</p> <p>T indicates alarm type and can have the value M = Momentary alarm state, or L = Latching alarm state.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>

NOTICE: *An analog input module requires a maximum of 2 seconds after it received an Enable Alarm command to let the settings take effect . During this interval, the module can not be addressed to perform any other actions.*

@AAEAT**Example**

command: @03EAL(cr)

response: !03(cr)

The analog input module at address 03h is instructed to enable its alarm in Latching mode.

The module confirms that the command has been received.

@AAHI

Name	Set High Alarm Limit
Description	Downloads High alarm limit value into the addressed module.
Syntax	<p>@AAHI(data)(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>HI is the Set High Limit command.</p> <p>(data) represent the value of the desired high limit setting. The format is always engineering units.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Example	<p>command: @04HI+080.00(cr)</p> <p>response: !04(cr)</p> <p>Presume the analog input module at address 04h is configured to accept T-type thermocouple input. The command will set the High alarm limit to 80°C.</p> <p>The module responds that the command has been received.</p>

NOTICE: *An analog input module requires a maximum of 2 seconds after it received an Set High Alarm command to let the settings take effect . During this interval, the module can not be addressed to perform any other actions.*

@AALO

Name	Set Low Alarm Limit
Description	Downloads Low alarm limit value into the addressed module.
Syntax	<p>@AALO(data)(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>LO is the Set Low Limit command.</p> <p>(data) represent the value of the desired low limit setting. The format is always engineering units.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exists.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Example	<p>command: @04LO-020.00(cr)</p> <p>response: !04(cr)</p> <p>Presume the analog input module at address 04h is configured to accept T-type thermocouple input. The command will set the Low alarm limit to -20°C.</p> <p>The module responds that the command has been received.</p>

NOTICE: *An analog input module requires a maximum of 2 seconds after it received an Set Low Alarm command to let the settings take effect . During this interval, the module can not be addressed to perform any other actions.*

@AADA

Name	Disable Alarm
Description	Disables all alarm functions of the addressed analog input module.
Syntax	<p>@AADA(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>DA is the Disable Alarm command.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Example	<p>command: @07DA (cr)</p> <p>response: !07(cr)</p> <p>The analog input module at address 07h is instructed to disable all alarm functions.</p> <p>The module confirms its alarm functions have been disabled.</p>

NOTICE: *An analog input module requires a maximum of 2 seconds after it received an Disable Alarm command to let the settings take effect . During this interval, the module can not be addressed to perform any other actions.*

@AACA

Name	Clear Latch Alarm
Description	Both alarm states (High and Low) of the addressed analog input module are set to OFF, no alarm.
Syntax	<p>@AACA(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>CA is the Clear Latch Alarm command.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist.</p> <p>! a delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Example	<p>command: @05CA(cr)</p> <p>response: !05(cr)</p> <p>The analog input module at address 05h is instructed to set both alarm states (High and Low) to OFF.</p> <p>The module confirms it has done so accordingly.</p>

@AARH

Name	Read High Alarm Limit
Description	The addressed module is asked to return its High alarm limit value.
Syntax	<p>@AARH(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>RH is the Read High Alarm Limit command.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(data)(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(data) is the value of the High alarm limit in engineering units.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Example	<p>command: @07RH(cr)</p> <p>response: !07+2.0500(cr)</p> <p>Presume the analog input module at address 07h is configured to accept 5 V input. The command instructs the module to return it High alarm limit value.</p> <p>The module responds its High alarm limit value is 2.0500 V.</p>

@AARL

Name	Read Low Alarm Limit
Description	The addressed module is asked to return its Low alarm limit value.
Syntax	<p>@AARL(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>RL is the Read Low Alarm Limit command.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(data)(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(data) is the value of the Low alarm limit in engineering units.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Example	<p>command: @05RL(cr)</p> <p>response: !05-0.3750(cr)</p> <p>Presume the analog input module at address 05h is configured to accept 1 V input. The command instructs the module to return its Low alarm limit value.</p> <p>The module responds its Low alarm limit value is -0.3750 V.</p>

@AARE

Name	Read Event Counter
Description	The addressed module is instructed to return its event counter value.
Syntax	<p>@AARE(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>RE Read Event Counter command.</p> <p>(cr)represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(data)(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exists.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(data)represents the stored value, from '00000' to '65535'(The max value that can be held by the counter register is 65535).</p> <p>The number 65535 is held when the actual total counts exceed this number.</p> <p>(cr)represents terminating character, carriage return (0Dh).</p>
Example	<p>command: @08RE(cr)</p> <p>response: !0832011(cr)</p> <p>The command instructs the module at address 08h to return its counter value.</p> <p>The module responds that its counter value equals 32011.</p>

@AAACE

Name	Clear Event Counter
Description	The addressed module is instructed to reset its event counter to zero.
Syntax	<p>@AAACE(cr)</p> <p>@ is a delimiter character.</p> <p>AA (range 00-FF) represents the 2-character hexadecimal address of an analog input module.</p> <p>CE Clear Event Counter command.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Response	<p>!AA(cr) if the command was valid.</p> <p>There is no response if the module detects a syntax error or communication error or if the specified address does not exist.</p> <p>! delimiter character indicating a valid command was received.</p> <p>AA represents the 2-character hexadecimal address of the responding analog input module.</p> <p>(cr) represents terminating character, carriage return (0Dh).</p>
Example	<p>command: @09CE(cr)</p> <p>response: !09(cr)</p> <p>The command instructs the module at address 09h to set its event counter to zero.</p> <p>The module responds that its counter has been reset.</p>

