I-87088W
Command Set

1.1%AANNTTCCFF

Description:

This command is used to set the configuration of a module.

Syntax:

%AANNTTCCFF[CHKSUM](CR)

% Delimiter character

AA The address of the module to be configured in hexadecimal format (00 to FF)

NN The new address of the module in hexadecimal format (00 to FF)

TT The new type code, see Section 1.7 for details

CC The new Baud Rate code, see Section 1.7 for details. For the I-87088W, the rear slide switch must be moved to the INIT position in order to change Baud Rates. See Section A.1 for details.

FF The command used to set the checksum, and the input range settings (Section 1.7). For the I-87088W, the rear slide switch must be moved to the INIT position in order to change the checksum setting. See Section A.1 for details.

Response:

Valid Command: **!AA[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

! Delimiter for a valid command

? Delimiter for an invalid command (If the Baud Rate or checksum settings are changed without switching the rear slide switch to the INIT position, the module will return an invalid command.)

AA The address of the module in hexadecimal format (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: %0102500600 Response: !02

Changes the address of module 01 to 02 and the module returns a valid response.

Command: %0202520600 Response: !02

Sets the type of module 02 to be 52 (Virtual Battery Backup) and the module returns a valid response.

Command: %0202520A00 Response: ?02

Changes the Baud Rate of module 02 to 115200bps and the module returns an invalid response, because it is not in INIT mode.

Command: %0202520A00 Response: !01

Changes the Baud Rate of module 02 to 115200bps and the module is in INIT mode. The module returns a valid response.

Related Commands:

Section 2.6 $AA2, Section 2.54 ~AAI, Section 2.55 ~AATnn

Related Topics

Section 1.7 Configuration Tables, Section A.1 INIT pin Operation

Notes:

1. Changes to the address, type code and data format settings take effect immediately after a valid command is received. Changes to the Baud Rate and checksum settings take effect on the next power-on reset.
2. For the I-87088W, changing the Baud Rate and checksum settings can only be achieved using software only and is performed by using the following commands:
   I. Send a ~AATnn command. See Section 2.55 for details.
   II. Send a ~AAI command. See Section 2.54 for details.
   III. Send a %AANNTTCCFF command.

If the command is valid, the Baud Rate and checksum settings will be changed after the module responds with !AA.

1.2#AA

Description:

This command is used to read the DI count.

Syntax:

#AA[CHKSUM](CR)

#	Delimiter character
AA	The address of the module to be read (00 to FF)

Response:

Valid Command: **>(Data)[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

>	Delimiter character for a valid command
?	Delimiter character for an invalid command
(Data)	Count data from all DI channels
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: #01 Response:
>00000008000000090000000A0000000B0000000C0000000D0000000
E0000000F

Reads module 01 and returns the count of DI channel 0 (8), channel 1 (9), etc.

Related Commands:

Section 2.3 #AAN

1.3#AAN

Description:

This command is used to read the count of a specific channel.

Syntax:

#AAN[CHKSUM](CR)

#	Delimiter character
AA	The address of the module to be read (00 to FF)
N	The channel to be read, zero based

Response:

Valid Command:	**>(Data)[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

>	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
(Data)	The DI count of the specified channel
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: #032 Response: >00000008

Reads data from channel 2 of module 03.

Command: #029 Response: ?02

Reads data from channel 9 of module 02. An error is returned because channel 9 is invalid.

Related Commands:

Section 2.2 #AA

1.4#AA1cDD

Description:

This command is used to set the status of the PWM.

Syntax:

#AA1cDD[CHKSUM](CR)

#	Delimiter character
AA	The address of the module to be read (00 to FF)
1	The command to set the status of PWM
c	Specifies the channel to be set
DD	00: Sets the PWM output port to be off 01: Set s the PWM output port to be on

Response:

Valid Command:	**>[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**
>	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: #011201 Response: >

Sets the output of PWM channel 2 to be on.

Related Commands:

Section 2.5 #AAAcDD, Section 2.40 @AADODD

Note:

This command is the same as the #AAAcDD command.

1.5#AAAcDD

Description:

This command is used to set the status of the PWM.

Syntax:

#AA1cDD[CHKSUM](CR)

#	Delimiter character
AA	The address of the module to be read (00 to FF)
A	The command to set the status of PWM
c	Specifies the channel to be set
DD	00: Sets the PWM output port to be off 01: Set s the PWM output port to be on

Response:

Valid Command:	**>[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

>	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: #01A201　　　　Response: >

Sets the output of PWM channel 2 to be on.

Related Commands:

Section 2.4 #AA1cDD, Section 2.40 @AADODD

Note:

This command is the same as the #AA1cDD command.

1.6$AA2

Description:

This command is used to read the configuration of a module.

Syntax:

$AA2[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
2	The command to read the module configuration

Response:

Valid Command:	**!AATTCCFF[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
TT	The type code of the module, see Section 1.7 for details
CC	The Baud Rate code of the module, see Section 1.7 for details
FF	The checksum settings and the input range settings of the module, see Section 1.7 for details

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $012 Response: !01500600

Reads the configuration of module 01.

Command: $022 Response: !02520600

Reads the configuration of module 02.

Related Commands:

Section 2.1 %AANNTTCCFF

Related Topics:

Section 1.7 Configuration Tables

1.7$AA3N

Description:

This command is used to read maximum counter value.

Syntax:

$AA3N[CHKSUM](CR)

$ Delimiter character

AA The address of the module to be read (00 to FF)

3 The command to read the maximum counter value

N The channel to be read, zero based

Response:

Valid Command: **!AA(Data)[CHKSUM](CR)**

Invalid Command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command

? Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)

AA The address of the responding module (00 to FF)

(Data) 8 hexadecimal digits (00000001 to FFFFFFFF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $030 Response: >FFFFFFFF

Reads the maximum counter value of counter 0at address 01, return value 4294967295.

Related Commands:

Section 2.8 $AA3N(Data)

1.8$AA3N(Data)

Description:

This command is used to set the maximum counter value.

Syntax:

$AA3N[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
3	The command to set the maximum counter value
N	The channel to be set, zero based
(Data)	8 hexadecimal digits (00000001 to FFFFFFFF)

Response:

Valid Command:	**!AA [CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $030FFFFFFFF Response: !03

Sets the maximum counter value of counter 0 at address 01 to 4294967295, and returns the command was successful.

Related Commands:

Section 2.7 $AA3N

1.9$AA5

Description:

This command is used to read the reset status of a module.

Syntax:

$AA5[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
5	The command to read the reset status of the module

Response:

Valid Command: **!AAS[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
S	The reset status of the module 0: This is not the first time the command has been sent since the module was powered on, which denotes that there has been no module reset since the last $AA5 command was sent. 1: This is the first time the command has been sent since the module was powered on.

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $015 Response: !011

Reads the reset status of module 01. The response shows that it is the first time the $AA5 command has been sent since the module was powered-on.

Command: $015 Response: !010

Reads the reset status of module 01. The response shows that there has been no module reset since the last $AA5 command was sent.

1.10 $AA5VV

Description:

This command is used to specify the channel number of the DI counter to be enabled.

Syntax:

$AA5VV[CHKSUM](CR)

$ Delimiter character

AA The address of the module to be set (00 to FF)

5 The command to set the counter status

VV A two-digit hexadecimal value, where bit 0 corresponds to channel 0, bit 1 corresponds channel 1, and act. When the bit is 0, it means that the channel is disabled and 1 means that the channel is enabled.

Response:

Valid Command: **!AA [CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command

? Delimiter character for an invalid command

AA The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $0153A Response: !01

Enables the DI counter for channels 1, 3, 4 and 5, and disables all other channels. The module returns a valid response.

Related Commands:

Section 2.11 $AA6

1.11 $AA6

Description:

This command is used to read the status of the DI counter.

Syntax:

$AA6[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
6	The command to read the status of the DI counter

Response:

Valid Command: **!AAVV[CHKSUM](CR)**

Invalid Command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
VV	A two-digit hexadecimal value, where bit 0 corresponds to channel 0, bit 1 corresponds channel 1, etc. When the bit is 0, it means that the channel is disabled, and 1 means that the channel is enabled.

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $016 Response: !013A

Reads the channel status of module 01 and returns a response of 3A, meaning that channels 1, 3, 4 and 5 are enabled and all other channels are disabled.

Related Commands:

Section 2.10 $AA5VV

1.12 $AA6N

Description:

This command is used to reset the counter of a specific channel.

Syntax:

$AA6N[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
6	The command to reset the counter
N	Specifies the channel to be reset, zero based

Response:

Valid Command:	**!AAVV[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $0160 Response: !01

Resets the counter 0 of module 01 to the preset value and returns that the command was successful.

Related Commands:

Section 2.42 @AAGN, Section 2.43 @AAPN(Data)

1.13 $AA6NN

Description:

This command is used to reset the DI counter.

Syntax:

$AA6N[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
6	The command to reset the DI counter
NN	A two-digit hexadecimal value, where bit 0 corresponds to channel 0, bit 1 corresponds channel 1, etc. When the bit is 0, it means that the channel is inactive, and 1 means that the channel has been reset.

Response:

Valid Command: **!AAVV[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01601 Response: !01

Reset the counter 0 of module 01 to the preset value and returns that the command was successful.

Related Commands:

Section 2.42 @AAGN, Section 2.43 @AAPN(Data), Section 2.11 $AA6

1.14 $AA7N

Description:

This command is used to read the status of the overflow flag.

Syntax:

$AA7N[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
7	The command to read the status of the overflow flag
N	Specifies the channel to be read, zero based

Response:

Valid Command:	**!AAS[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect.)
AA	The address of the responding module (00 to FF)
S	The overflow flag of channel N 0: The counter has not exceeded the maximum counter and the overflow flag has been cleared. 1: The counter has exceeded the maximum counter value and the overflow flag has been set.

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $0170 Response: !010

Reads the status of the overflow flag for counter 0 of module 01 and returns that the counter has not been exceeded.

Related Commands:

Section 2.7 $AA3N, Section 2.8 $AA3N(Data), Section 2.12 $AA6N, Section 2.13 $AA6NN

1.15 $AA8

Description:

This command is used to read the configuration of LED.

Syntax:

$AA8[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
8	The command to read the configuration of LED

Response:

Valid Command: **!AAS[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect.)
AA	The address of the responding module (00 to FF)
S	0~7: Shows the count of channel 0~7 8: Rotates the count of channel 0~7 9: Shows the host control

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $018 Response: !010

Read the configuration of the LED and return that is showing the count of DI channel 0.

Related Commands:

Section 2.16 $AA8V, Section 2.17 $AA9(Data)

1.16 $AA8V

Description:

This command is used to set the configuration of LED.

Syntax:

$AA8[CHKSUM](CR)

$ Delimiter character

AA The address of the module to be read (00 to FF)

8 The command to set the configuration of LED

V 0~7: Shows the count of channel 0~7
8: Rotates mode
9: Host control mode

Response:

Valid Command: **!AA[CHKSUM](CR)**

Invalid Command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command

? Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect.)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $0181 Response: !01

Set the LED to show the count of DI channel 1.

Related Commands:

Section 2.15 $AA8V, Section 2.17 $AA9(Data)

1.17 $AA9(Data)

Description:

This command is used to send the data to the LED display.

Syntax:

$AA8[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
9	The command to send the data to the LED display
(Data)	5 decimal digits + 1 decimal point (Max. = 99999. , Min. = 0.0000)

Response:

Valid Command: **!AA[CHKSUM](CR)**

Invalid Command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect.)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $0199999. Response: !01

Shows display “99999.” when the configuration LED is set to the host control mode.

Related Commands:

Section 2.15 $AA8V, Section 2.16 $AA8V

1.18 $AAB

Description:

This command is used to read the power down count.

Syntax:

$AAB[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
B	The command to read the power down count

Response:

Valid Command:	**!AA(Data)[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
(Data)	2 hexadecimal digits (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01B Response: !0110

Reads the power down count of module 01 and returns a value of 16.

Related Commands:

Section 2.19 $AABR

1.19 $AABR

Description:

This command is used to clear the power down count.

Syntax:

$AABR[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
BR	The command to clear the power down count

Response:

Valid Command:	**!AA[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01B Response: !0110

Read the power down count of module 01 and returns a value of 16.

Command: $01BR Response: !01

Clear the power down count of module 01 and returns that the command was successful.

Command: $01B Response: !0100

Read the power down count of module 01 and returns that a power down event has never happened.

Related Commands:

Section 2.18 $AAB

1.20 $AACnD

Description:

This command is used to read the duty cycle.

Syntax:

$AACnD[CHKSUM](CR)

$ Delimiter character
AA The address of the module to be read (00 to FF)
Cn n specifies the channel to be read
D The command to read the duty cycle

Response:

Valid Command: **!AA(Data)[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command
? Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect.)
AA The address of the responding module (00 to FF)
(Data) The duty cycle of the specified channel (00.1 to 99.9)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0D Response: !0150.0

Reads the duty cycle of PWM channel 0 and returns a value of 50%.

Command: $01C1D Response: !0133.3

Reads the duty cycle of PWM channel 1 and returns a value of 33.3%.

Related Commands:

Section 2.21 $AACnD(Data)

1.21 $AACnD(Data)

Description:

This command is used to set the duty cycle.

Syntax:

$AACnD[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
Cn	n specifies the channel to be set
D	The command to set the duty cycle
(Data)	The duty cycle of the specified channel (00.1 to 99.9)

Response:

Valid Command:	**!AA(Data)[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
(Data)	The actual duty cycle of the specified channel (00.1 to 99.9)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0D50.0 Response: !0150.0

Sets the duty cycle of PWM channel 0 to 50% and returns the true output of 50%.

Command: $01C1D33.4 Response: !0133.3

Set the duty cycle of PWM channel 1 to 33.4% and returns the true output of 33.3%.

Related Commands:

Section 2.20 $AACnD

1.22 $AACnF

Description:

This command is used to read the frequency.

Syntax:

$AACnF[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
Cn	n specifies the channel to be read
F	The command to read the frequency

Response:

Valid Command:	**!AA(Data)[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect.)
AA	The address of the responding module (00 to FF)
(Data)	The actual frequency of the specified channel (000001 to 500000)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0F Response: !01500000

Reads the frequency of PWM channel 0 and returns a value of 500 KHz.

Command: $01C2F Response: !01000001

Reads the frequency of PWM channel 2 and returns a value of 1 Hz.

Related Commands:

Section 2.23 $AACnF(Data)

1.23 $AACnF(Data)

Description:

This command is used to set the frequency.

Syntax:

$AACnF(Data)[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
Cn	n specifies the channel to be set
F	The command to set the frequency
(Data)	The frequency of the specified channel (000001 to 500000)

Response:

Valid Command:	**!AA(Data)[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
(Data)	The actual frequency of the specified channel (000001 to 500000)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0F 500000 Response: !01500000

Sets the frequency of PWM channel 0 to 500 KHz and returns the actual frequency of 500 KHz. The duty cycle will be set to 50.0% automatically.

Command: $01C2F340000 Response: !01333333

Sets the frequency of PWM channel 2 to 340 KHz and returns the actual frequency of 333333 Hz. The duty cycle will be set to 33.3% automatically.

Related Commands:

Section 2.22 $AACnF

Note:

After using the $AACnF(Data) command, the duty cycle value will be reset to 50.0% automatically.

1.24 $AACnM

Description:

This command is used to read the continuous mode of a specified channel.

Syntax:

$AACnM[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
Cn	n specifies the channel to be read
M	The command to read the continuous mode

Response:

Valid Command:	**!AAS[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA	The address of the responding module (00 to FF)
S	0: PWM continuous mode is disabled 1: PWM continuous mode is enabled

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0M Response: !010

Reads PWM continuous mode of channel 0 and returns that it is disabled.

Command: $01C1M Response: !011

Reads PWM continuous mode of channel 1 and returns that it is enabled.

Related Commands:

Section 2.25 $AACnMS, Section 2.26 $AACnP, Section 2.27 $AACnP(Data)

1.25 $AACnMS

Description:

This command is used to set the continuous mode of a specified channel.

Syntax:

$AACnMS[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
Cn	n specifies the channel to be set
M	The command to set continuous mode
S	0: Disables PWM continuous mode 1: Enables PWM continuous mode (If the PWM continuous mode is enabled, the step value for PWM will be set to 1 automatically)

Response:

Valid Command:	**!AA[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0M1 Response: !01

Sets the PWM continuous mode of channel 0 to enabled and the PWM step value will be set to 1 automatically.

Command: $01C1M0 Response: !01

Sets the PWM continuous mode of channel 1 to disabled and the PWM step value will not be affected.

Related Commands:

Section 2.24 $AACnM, Section 2.26 $AACnP, Section 2.27 $AACnP(Data)

1.26 $AACnP

Description:

This command is used to read the step value for a specified channel.

Syntax:

$AACnP[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
Cn	n specifies the channel to be read
P	The command to read the PWM step value

Response:

Valid Command:	**!AA(Data)[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA	The address of the responding module (00 to FF)
(Data)	PWM step value (0001 to FFFF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0P Response: !01001A

Reads the PWM step value for channel 0 and returns a value of 26 steps.

Command: $01C1P Response: !011000

Reads the PWM step value for channel 1 and returns a value of 4096 steps.

Related Commands:

Section 2.24 $AACnM, Section 2.25 $AACnMS, Section 2.27 $AACnP(Data)

1.27 $AACnP(Data)

Description:

This command is used to set the step value for a specified channel.

Syntax:

$AACnP(Data)[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
Cn	n specifies the channel to be set
P	The command to set the PWM step value
(Data)	PWM steps (0001 to FFFF) (When set to more than 1 step, the PWM continuous mode will be set to disabled automatically)

Response:

Valid Command:	**!AA[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	Address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0P0001 Response: !01

Sets the PWM step value for channel 0 to 1.

Command: $01C1P001A Response: !01

Sets the PWM step value for channel 1 to 4096 steps and the PWM continuous mode of channel 1 will be set to disabled automatically.

Related Commands:

Section 2.24 $AACnM, Section 2.25 $AACnMS, Section 2.26 $AACnP

1.28 $AACnT

Description:

This command is used to read the status of the PWM hardware trigger of a specified channel.

Syntax:

$AACnT[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
Cn	n specifies the channel to be read
T	The command to read the PWM hardware trigger

Response:

Valid Command: **!AAS[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA	The address of the responding module (00 to FF)
S	0: The hardware trigger is disabled 1: The trigger start is enabled 2: The trigger stop is enabled

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0T Response: !011

Reads the status of the PWM channel 0 hardware trigger and returns that the PWM channel 0 trigger will start when the rising edge of the DI is received.

Command: $01C1T Response: !010

Reads the status of the PWM channel 1 hardware trigger and returns the PWM channel 1 will not be affected when the rising edge of the DI is received.

Related Commands:

Section 2.29 $AACnTS

1.29 $AACnTS

Description:

This command is used to set the hardware trigger of a specified channel.

Syntax:

$AACnTS[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
Cn	n specifies the channel to be set
T	The command to set PWM hardware trigger
S	0: Disables the hardware trigger 1: Enables the trigger start 2: Enables the trigger stop

Response:

Valid Command:	**!AA[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0T2 Response: !01

Sets the status of the PWM channel 0 hardware trigger to trigger stop. When the rising edge of the DI is received, the status of the PWM will be set to trigger stop.

Command: $01C1T 0 Response: !010

Sets the status of the PWM channel 1 hardware trigger to disabled. The PWM will not be affect when the rising edge of the DI is received.

Related Commands:

Section 2.28 $AACnT

1.30 $AACnN

Description:

This is command is used to read the synchronization status of a specified channel.

Syntax:

$AACnN[CHKSUM](CR)

$ Delimiter character
AA The address of the module to be read (00 to FF)
Cn n specifies the channel to be read
N The command to read PWM synchronization status

Response:

Valid Command: **!AAS[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command
? Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA The address of the responding module (00 to FF)
S 0: Synchronization disabled
1: Synchronization enabled

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0N Response: !011

Reads the PWM channel 0 synchronization status and returns that it is enabled.

Command: $01C1N Response: !010

Reads the PWM channel 1 synchronization status and return that it is disabled.

Related Commands:

Section 2.31 $AACnNS, Section 2.39 $AAYS

1.31 $AACnNS

Description:

This command is used to set the synchronization status of a specified channel.

Syntax:

$AACnN[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be set (00 to FF)
Cn	n specifies the channel to be set
N	The command to set PWM synchronized
S	0: Disables synchronization 1: Enables synchronization

Response:

Valid Command:	**!AA[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01C0N1 Response: !01

Sets the PWM channel 0 synchronization status to enabled.

Command: $01C1N0 Response: !01

Sets the PWM channel 1 synchronization status to disabled.

Related Commands:

Section 2.30 $AACnN, Section 2.39 $AAYS

1.32 $AAF

Description:

This command is used to read the firmware version of a module.

Syntax:

$AAF[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
F	The command to read the firmware version

Response:

Valid command:	**!AA(Data)[CHKSUM](CR)**
Invalid command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
(Data)	The firmware version of the module as a string value

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01F Response: !01A2.0

Reads the firmware version of module 01, and shows that it is version A2.0.

Command: $02F Response: !02B1.1

Reads the firmware version of module 02, and shows that it is version B1.1.

1.33 $AAI

Description:

This command is used to read the INIT status of a module.

Syntax:

$AAI[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
I	The command to read the INIT status of the module

Response:

Valid command: **!AAS[CHKSUM](CR)**
Invalid command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
S	0: The INIT switch is in the INIT position 1: The INIT switch is in the Normal position

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01I Response: !010

Reads the status of the INIT switch of module 01. The response shows that the INIT switch is in the INIT position.

1.34 $AAM

Description:

This command is used to read the name of a module.

Syntax:

$AAM[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
M	The command to read the module name

Response:

Valid command: **!AA(Data)[CHKSUM](CR)**
Invalid command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
(Name)	The name of the module as string value

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01M Response: !017088

Reads the name of module 01 and returns the name “7088”.

Related Commands:

Section 2.46 ~AAO(Name)

1.35 $AAP

Description:

This command is used to read the protocol of the communication.

Syntax:

$AAM[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
P	The command to read the communication protocol

Response:

Valid command: **!AASC[CHKSUM](CR)**
Invalid command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
S	0: Only DCON protocol is supported 1: Both the DCON and Modbus RTU protocols are supported
C	0: The protocol set in EEPROM is DCON 1: The protocol set in EEPROM is Modbus RTU

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01P Response: !0110

Reads the communication protocol of module 01 and returns a response of 10 meaning that it supports both DCON and Modbus RTU protocols and the protocol that will be used at the next power on reset is DCON.

Related Commands:

Section 2.36 $AAPN

1.36 $AAPN

Description:

This command is used to read the protocol of the communication.

Syntax:

$AAM[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be read (00 to FF)
P	The command to set the communication protocol
N	0: DCON 1: Modbus RTU Before using this command, the rear slide switch must be in the INIT position, see Section A.1 for details. The new protocol is saved in the EEPROM and will be effective after the next power on reset.

Response:

Valid command:	**!AASC[CHKSUM](CR)**
Invalid command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01P1 Response: ?01

Sets the communication protocol of module 01 to Modbus RTU and returns an invalid response because the module is not in INIT mode.

Command: $01P1 Response: !01

Sets the communication protocol of module 01 to Modbus RTU and returns a valid response.

Related Commands:

Section 2.35 $AAP

1.37 $AAR

Description:

This command is used to reset the PWM.

Syntax:

$AAR[CHKSUM](CR)

$ Delimiter character
AA The address of the module to be reset (00 to FF)
R The command to reset the PWM

Response:

Valid Command: **!AA[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command
? Delimiter character for an invalid command
AA The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01R Response: !01

Resets the PWM and stops all of the outputs.

1.38 $AAW

Description:

This command is used to save the PWM configuration.

Syntax:

$AAW[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be accessed (00 to FF)
W	The command to save the PWM configuration

Response:

Valid Command:	**!AA[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01W Response: !01

Saves the PWM configuration for all channels into EEPROM. After the next power on, the PWM configuration will automatically load from the EEPROM without giving any notification.

1.39 $AAYS

Description:

This command is used to start the synchronization.

Syntax:

$AAYS[CHKSUM](CR)

$	Delimiter character
AA	The address of the module to be accessed (00 to FF)
Y	The command to set the PWM synchronization
S	0: Stop synchronization 1: Start synchronization

Response:

Valid Command:	**!AA[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01Y1 Response: !01

Starts the PWM output that has been set to synchronized.

Command: $01Y0 Response: !01

Stops the PWM output that has been set synchronized.

1.40 @AADODD

Description:

This command is used to set the status of the PWM.

Syntax:

@AADODD[CHKSUM](CR)

@ Delimiter character

AA The address of the module to be set (00 to FF)

DO The command to set PWM output

DD A two-digit hexadecimal value, where bit 0 corresponds to channel 0, bit 1 corresponds to channel 1, etc. When the bit is 0, it denotes that the PWM output port is off, and 1 denotes that the PWM output port is on.

Response:

Valid command: **!AA[CHKSUM](CR)**

Invalid command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command

? Delimiter character for an invalid command

AA The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: @01DO33 Response: !01

Sets channel 0 to on, channel 1 to on, channel 2 to off, channel 3 to off, channel 4 to on, and channel 5 to on, and the module returns a valid response.

Related Commands:

Section 2.41 @AADI

Note:

1. When a host watchdog timeout occurs, the module will return an invalid response for this command and the PWM value that was sent is ignored.

1.41 @AADI

Description:

This command is used to read the status of the PWM and digital input.

Syntax:

@AADI[CHKSUM](CR)

@ Delimiter character

AA The address of the module to be read (00 to FF)

DI The command to read the status of the PWM and digital input

Response:

Valid Command: **!AAOOII[CHKSUM](CR)**

Invalid Command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command

? Delimiter character for an invalid command

AA The address of the responding module (00 to FF)

OO A two-digit hexadecimal value, where bit 0 corresponds to PWM channel 0, bit 1 corresponds to PWM channel 1, etc. When the bit is 0 it means that the PWM is in active and 1 means that the PWM is active.

II A two-digit hexadecimal value, where bit 0 corresponds to DI channel 0, bit 1 corresponds to DI channel 1, etc. When the bit is 0 it means that the DI is in active and 1 means that the DI is active.

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: @01DI   Response: !0101F0

Reads the status of the PWM and DI and returns that PWM channel 0 is active and the others are inactive. DI channels 4, 5, 6 and 7 are active and the others are inactive.

Related Commands:

Section 2.40 @AADODD, Section2.44 ~AAD, Section 2.45 ~AADVV

1.42 @AAGN

Description:

This command is used to read the preset value of a specified channel.

Syntax:

@AAGN[CHKSUM](CR)

@	Delimiter character
AA	The address of the module to be read (00 to FF)
G	The command to read the preset value of the DI counter
N	Specifies the channel to be read, zero based

Response:

Valid Command: **!AA(Data)[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command (An invalid command is returned if the specified channel is incorrect)
AA	The address of the responding module (00 to FF)
(Data)	8 hexadecimal digits (00000000 to FFFFFFFE)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: @01G0 Response: !0100000000

Reads the preset count value for counter 0 of module 01 and returns that the preset value is 0.

Related Commands:

Section 2.43 @AAPN(Data)

1.43 @AAPN(Data)

Description:

This command is used to set the preset value of specified channel.

Syntax:

@AAPN(Data)[CHKSUM](CR)

@	Delimiter character
AA	The address of the module to be set (00 to FF)
P	The command to set the preset value of the DI counter
N	Specifies the channel to be set, zero based.
(Data)	8 hexadecimal digits (00000000 to FFFFFFFE)

Response:

Valid Command:	**!AA[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: @01P000000000 Response: !01

Sets the preset count value for counter 0 of module 01 to 0 and returns that the command was successful.

Related Commands:

Section 2.42 @AAGN

1.44 ~AAD

Description:

This command is used to read the miscellaneous settings.

Syntax:

~AAD[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be read (00 to FF)
D	The command to read the miscellaneous settings

Response:

Valid Command:	**!AAVV[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)
VV	A two-digit hexadecimal value, where bit 0 corresponds to the active status of the DI as indicated below. The other bits are reserved. 0: Input value 1 for non-signal or low voltage Input value 0 for high voltage 1: Input value 1 for high voltage Input value 0 for non-signal or low voltage

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01D Response: !0101

Reads the miscellaneous settings of module 01 and returns 01.

Related Commands:

Section 2.45 ~AADVV

1.45 ~AADVV

Description:

This command is used to set the miscellaneous settings.

Syntax:

~AADVV[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be set (00 to FF)
D	The command to set the miscellaneous settings
VV	A two-digit hexadecimal value, where bit 0 corresponds to the active status of the DI as indicated below. The other bits are reserved. 0: Input value 1 for non-signal or low voltage Input value 0 for high voltage 1: Input value 1 for high voltage Input value 0 for non-signal or low voltage

Response:

Valid Command:	**!AAVV[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: $01D01 Response: !01

Sets the miscellaneous settings of module 01 and returns a valid response.

Related Commands:

Section 2.44 ~AAD

1.46 ~AAO(Name)

Description:

This command is used to set the name of a module.

Syntax:

~AAO(Name)[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be set (00 to FF)
O	The command to set the name of the module
(Name)	The new name of the module (max. 6 characters)

Response:

Valid command: **!AA[CHKSUM](CR)**
Invalid command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~01O7088 Response: !01

Sets the name of module 01 to “7088” and returns a valid response.

Command: $01M Response: !017088

Reads the name of module 01 and returns the name “7088”.

Related Commands:

Section 2.34 $AAM

1.47 ~AARD

Description:

This command is used to read the response delay time.

Syntax:

~AARD[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be read (00 to FF)
RD	The command to read the response time

Response:

Valid Command:	**!AATT[CHKSUM](CR)**
Invalid Command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
TT	Two hexadecimal digits to represent the response time value in milliseconds. The value must be less than or equal to 1E. For example, 01 denotes 1 millisecond and 1A denotes 26 milliseconds.
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~01RD10 Response: !01

Sets the response time to 16 milliseconds.

Command: ~01RD Response: !0110

Reads the response time is 16 milliseconds and the response will be sent after 16 milliseconds have elapsed.

Related Commands:

Section 2.48 ~AARDTT

1.48 ~AARDTT

Description:

This command is used to set the response delay time.

Syntax:

~AARDTT[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be set (00 to FF)
RD	The command to set response time
TT	Two hexadecimal digits to represent the response time value in milliseconds. The value must be less than or equal to 1E. For example, 01 denotes 1 millisecond and 1A denotes 26 milliseconds.

Response:

Valid Command: **!AA[CHKSUM](CR)**
Invalid Command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~01RD10 Response: !01

Sets response time to 16 milliseconds.

Command: ~01RD Response: !0110

Reads that the response time is 16 milliseconds and the response will be sent after 16 milliseconds have elapsed.

Related Commands:

Section 2.47 ~AARD

1.49 ~**

Description:

This command is used to inform all modules that the host is OK.

Syntax:

~[CHKSUM](CR)**

~	Delimiter character
**	Host OK command

Response:

No response.

Examples:

Command: ~** No response

Sends a “Host OK” command to all modules.

Related Commands:

Section 2.50 ~AA0, Section 2.51 ~AA1, Section 2.52 ~AA2, Section 2.53 ~AA3ETT

Related Topics:

Section A.2 Dual Watchdog Operation

1.50 ~AA0

Description:

This command is used to read the status of a module's host watchdog.

Syntax:

~AA0[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be read (00 to FF)
0	The command to read the module status

Response:

Valid command: **!AASS[CHKSUM](CR)**
Invalid command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command

? Delimiter character for an invalid command

AA The address of the responding module (00 to FF)

SS Two hexadecimal digits that represent the host watchdog status, where:
Bit 2: 0 indicates that no host watchdog timeout has occurred, and 1 indicates that a host watchdog timeout has occurred.
Bit 7: 0 indicates that the host watchdog is disabled, and 1 indicates that the host watchdog is enabled,
The status of the host watchdog is stored in EEPROM and can only be reset by using the ~AA1 command.

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~010 Response: !0100

Reads the status of the host watchdog of module 01 and returns 00, meaning that the host watchdog is disabled and no host watchdog timeout has occurred.

Command: ~020 Response: !0204

Reads the status of the host watchdog of module 02 and returns 04, meaning that a host watchdog timeout has occurred.

Related Commands:

Section 2.49 ~**, Section 2.51 ~AA1, Section 2.52 ~AA2, Sec 2.53 ~AA3ETT

Related Topics:

Section A.2 Dual Watchdog Operation

1.51 ~AA1

Description:

This command is used to reset the timeout status of a module's host watchdog.

Syntax:

~AA1[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be reset (00 to FF)
1	The command to reset the host watchdog timeout status

Response:

Valid command:	**!AA[CHKSUM](CR)**
Invalid command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~010 Response: !0104

Reads the status of the host watchdog of module 01 and shows that a host watchdog timeout has occurred.

Command: ~011 Response: !01

Resets the timeout status of the host watchdog of module 01 and returns a valid response.

Command: ~010 Response: !0100

Reads the status of the host watchdog of module 01 and shows that no host watchdog timeout has occurred.

Related Commands:

Section 2.49 ~**, Section 2.50 ~AA0, Section 2.52~AA2, Section 2.53~AA3ETT

Related Topics:

Section A.2 Dual Watchdog Operation

1.52 ~AA2

Description:

This command is used to read the timeout value of a module’s host watchdog.

Syntax:

~AA2[CHKSUM](CR)

~ Delimiter character

AA The address of the module to be read (00 to FF)

2 The command to read the host watchdog timeout value

Response:

Valid command: **!AAETT[CHKSUM](CR)**

Invalid command: **?AA[CHKSUM](CR)**

! Delimiter character for a valid command

? Delimiter character for an invalid command

AA The address of the responding module (00 to FF)

E 0: the host watchdog is disabled
1: the host watchdog is enabled

TT Two hexadecimal digits to represent the timeout value in tenths of a second, for example, 01 denotes 0.1 seconds and FF denotes 25.5 seconds.

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~012 Response: !011FF

Reads the host watchdog timeout value of module 01 and returns FF, which denotes that the host watchdog is enabled and the host watchdog timeout value is 25.5 seconds.

Related Commands:

Section 2.49 ~**, Section 2.50 ~AA0, Section 2.51 ~AA1, Section 2.53 ~AA3ETT

Related Topics:

Section A.2 Dual Watchdog Operation

1.53 ~AA3ETT

Description:

This command is used to enable/disable the host watchdog and set the host watchdog timeout value of a module.

Syntax:

~AA3ETT[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be set (00 to FF)
3	The command to set the host watchdog
E	0: Disable the host watchdog 1: Enable the host watchdog
TT	Two hexadecimal digits to represent the timeout value in tenths of a second, for example, 01 denotes 0.1 seconds and FF denotes 25.5 seconds.

Response:

Valid command: **!AA[CHKSUM](CR)**

Invalid command: **?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~013164 Response: !01

Enables the host watchdog of module 01 and sets the host watchdog timeout value to 10.0 seconds. The module returns a valid response.

Command: ~012 Response: !01164

Reads the host watchdog timeout value of module 01. The module returns 164, which denotes that the host watchdog is enabled and the host watchdog timeout value is 10.0 seconds.

Related Commands:

Section 2.49 ~**, Section 2.50 ~AA0, Section 2.51 ~AA1, Section 2.52 ~AA2

Related Topics:

Section A.2 Dual Watchdog Operation

Note:

When a host watchdog timeout occurs, the host watchdog is disabled and all of the PWM outputs are stopped. The ~AA3EVV command should be sent again to enable the host watchdog.

1.54 ~AAI

Description:

This command is the software INIT command and is used to enable modification of the Baud Rate and checksum settings using software only.

Syntax:

~AAI[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be set (00 to FF)
I	The command to set the software INIT

Response:

Valid command:	**!AA[CHKSUM](CR)**
Invalid command:	**?AA[CHKSUM](CR)**

!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~01I   Response: !01

Sets the software INIT of module 01 and returns a valid response.

Related Commands:

Section 2.1 %AANNTTCCFF, Section 2.55 ~AATnn

Related Topics:

Section A.1 INIT Mode

Note:

The ~AATnn command should be sent prior to sending this command, see Section 2.55 for details.

1.55 ~AATnn

Description:

This command is used to set the software INIT timeout value.

Syntax:

~AATnn[CHKSUM](CR)

~	Delimiter character
AA	The address of the module to be set (00 to FF)
T	The command to set the software INIT timeout value.
nn	Two hexadecimal digits representing the timeout value in seconds. The max timeout value is 60 seconds. When changing the Baud Rate and checksum settings without altering the position of the INIT* pin, the ~AAI and %AANNTTCCFF commands should be sent consecutively and the time interval between the two commands should be less than the software INIT timeout value. If the software INIT timeout value is 0, then the Baud Rate and checksum settings cannot be changed using software only. The power on reset value of the Software INIT timeout is 0.

Response:

Valid command:	**!AA[CHKSUM](CR)**
Invalid command:	**?AA[CHKSUM](CR)**
!	Delimiter character for a valid command
?	Delimiter character for an invalid command
AA	The address of the responding module (00 to FF)

There will be no response if the command syntax is incorrect, there is a communication error, or there is no module with the specified address.

Examples:

Command: ~01I Response: !01

Sets the software INIT of module 01 and returns a valid response.

Command:%0101500700 Response:?01

Attempts to change the Baud Rate of module 01 to 19200 without first altering the position of the INIT* pin. The module returns an invalid response because the software INIT timeout value is 0.

Command:~01T10 Response:!01

Sets the software INIT timeout value of module 01 to 16 seconds and returns a valid response.

Command:~01I Response:!01

Sets the software INIT of module 01 and returns a valid response.

Command:%0101500700 Response:!01

Attempts to change the Baud Rate of module 01 to 19200 without first altering the position of the INIT* pin. The module returns a valid response.

Related Commands:

Section 2.1 %AANNTTCCFF, Section 2.54 ~AAI

Related Topics:

Section A.1 INIT Mode

Note:

It is recommended that the software INIT timeout value is reset to 0 once any changes to the Baud Rate and checksum settings have been completed.