I-87017ZW
Command Sets

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1.0 Default Settings

Default settings for the I-87017ZW are:

- Module address: 01
- Analog input type: Type 08, -10V to 10V
- Baud Rate: 115200 bps
- Checksum disabled
- Engineering unit format
- Filter set at 60Hz rejection
- Differential input

1.1 Calibration

Warning: *It is not recommended that calibration be performed until the process is fully understood.*

The calibration procedure is as follows:

1. Warm up the module for 30 minutes.
2. Set the type code to the type you want to calibrate. Refer to Section 2.9 for details.
3. Enable calibration. Refer to Section 2.14 for details.
4. Apply the zero calibration voltage/current.
5. Send the zero calibration command. Refer to Section 2.5for details.
6. Apply the span calibration voltage/current.
7. Send the span calibration command. Refer to Section 2.4 for details.
8. Repeat steps 3 to 7 three times.

Notes:

1. Connect the calibration voltage/current to channel 0.
2. When calibrating type 0D, the jumper of channel 0 should be set to the current input position.
3. Calibration voltages and currents are shown below.

Calibration voltages/current used by the I-87017ZW:

Type Code	08	09	0A	0B	0C	0D
Zero Input	0V	0V	0V	0mV	0mV	0mA
Span Input	+10V	+5V	+1V	+500mV	+150mV	+20mA

1.2 Configuration Tables

Baud Rate Setting (CC)

Bits 5:0

Code	03	04	05	06	07	08	09	0A
Baud Rate	1200	2400	4800	9600	19200	38400	57600	115200

Bits 7:6

00: no parity, 1 stop bit
01: no parity, 2 stop bits
10: even parity, 1 stop bit
11: odd parity, 1 stop bit

Note: The data bits are fixed at one start bit, eight data bits

Analog Input Type Setting (TT)

Type Code	Analog Input Type	Range
07	+4 to +20mA	4mA ~ 20mA
08	+/-10V	-10V ~ 10V
09	+/-5V	-5V ~ 5V
0A	+/-1V	-1V ~ 1V
0B	+/-500mV	-500mV ~ 500mV
0C	+/-150mV	-150mV ~ 150mV
0D	+/-20mA	-20mA ~ 20mA
1A	0 to +20mA	0 ~ 20mA

Note:
When type 07, 0D or 1A is selected, the jumper of the corresponding channel should be set to the current input position.

Data Format Setting (FF)

7	6	5	4	3	2	1	0
FS	CS	MS	Reserved			DF	

Key	Description
DF	Data format 00: Engineering unit 01: % of FSR (full scale range) 10: 2’s complement hexadecimal
MS	Mode settings 0: Normal mode (16 bits) 1: Fast mode (12 bits)
CS	Checksum settings 0: Disabled 1: Enabled
FS	Filter settings 0: 60Hz rejection 1: 50Hz rejection

Note: The reserved bits should be zero.

Analog Input Type and Data Format Table

Type code	Input Type	Data Format	+F.S	-F.S.
07	+4 to +20 mA	Engineering unit	+20.000	+04.000
		% of FSR	+100.00	+000.00
		2’s comp HEX	FFFF	0000
08	-10 to +10 V	Engineering unit	+10.000	-10.000
		% of FSR	+100.00	-100.00
		2’s comp HEX	7FFF	8000
09	-5 to +5 V	Engineering unit	+5.0000	-5.0000
		% of FSR	+100.00	-100.00
		2’s comp HEX	7FFF	8000
0A	-1 to +1 V	Engineering unit	+1.0000	-1.0000
		% of FSR	+100.00	-100.00
		2’s comp HEX	7FFF	8000
0B	-500 to +500 mV	Engineering unit	+500.00	-500.00
		% of FSR	+100.00	-100.00
		2’s comp HEX	7FFF	8000
0C	-150 to +150 mV	Engineering unit	+150.00	-150.00
		% of FSR	+100.00	-100.00
		2’s comp HEX	7FFF	8000
0D	-20 to +20 mA	Engineering unit	+20.000	-20.000
		% of FSR	+100.00	-100.00
		2’s comp HEX	7FFF	8000
1A	0 to +20 mA	Engineering unit	+20.000	+00.000
		% of FSR	+100.00	+000.00
		2’s comp HEX	FFFF	0000

2.0 DCON Protocol

All communication with I-87K I/O modules consists of commands generated by the host and responses transmitted by the I-87K I/O modules. Each module has a unique ID number that is used for addressing purposes and is stored in non-volatile memory. The ID is 01 by default and can be changed using a user command. All commands to the modules contain the ID address, meaning that only the addressed module will respond. The only exception to this is command ~** (Section 2.18), which are sent to all modules, but in these cases, the modules do not reply to the command.

Command Format:

Leading Character	Module Address	Command	[CHKSUM]	CR

Response Format:

Leading Character	Module Address	Data	[CHKSUM]	CR

CHKSUM A 2-character checksum that is present when the checksum setting is enabled. See Section 1.2 and 2.1 for details.

CR End of command character, carriage return (0x0D)

Checksum Calculation:

1. Calculate the ASCII code sum of all the characters in the command/response string except for the carriage return character (CR).
2. The checksum is equal to the sum masked by 0ffh.

Example:

Command string: $012(CR)

1. Sum of the string = “$”+”0”+”1”+”2” = 24h+30h+31h+32h = B7h
2. Therefore the checksum is B7h, and so CHKSUM = “B7”
3. The command string with the checksum = $012B7(CR)

Response string: !01200600(CR)

1. Sum of the string = “!”+”0”+”1”+”2”+”0”+”0”+”6”+”0”+”0” = 21h+30h+31h+32h+30h+30h+36h+30h+30h = 1AAh
2. Therefore the checksum is AAh, and so CHKSUM = “AA”
3. The response string with the checksum = !01200600AA(CR)

Note:

All characters should be in upper case.

2.1 %AANNTTCCFF

Description:

Sets the configuration of an analog input module.

Syntax:

%AANNTTCCFF[CHKSUM](CR)

%	Delimiter character
AA	Address of the module to be configured in hexadecimal format (00 to FF)
NN	New address of the module in hexadecimal format (00 to FF)
TT	Not used by the I-87017ZW, should be set to 00.
CC	New Baud Rate code, see Section 1.2 for details. To change the Baud Rate, the module should be in INIT* mode.
FF	Used to set the data format, checksum, and filter settings (Section 1.2). To change the checksum setting, the module should be in INIT* mode.

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response. If changing the **Baud Rate** or **checksum** settings without setting the module in INIT* mode, the module will return an invalid command.
AA	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: %0102000600 Response: !02

Change the address of module 01 to 02. The module returns a valid response.

Command: %0202000602 Response: !02

Set the data format of module 02 to be 2 (2's complement hexadecimal). The module returns a valid response.

Command: %0101000A00 Response: ?01

Change the Baud Rate of module 01 to 115200bps. The module returns an invalid command, because it is not in INIT* mode.

Command: %0101000A00 Response: !01

Change the Baud Rate of module 01 to 115200bps and the module is in INIT* mode. The module returns a valid response.

Related Commands:

Section 2.6 $AA2

Related Topics:

Section 1.2 Configuration Tables

Notes:

Changes to the address, type code, data format and filter 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.

2.2 #AA

Description:

Reads the data from every analog input channel.

Syntax:

#AA[CHKSUM](CR)

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

Response:

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

>	Delimiter character for a valid response
?	Delimiter character for an invalid response
(Data)	Data from every analog input channels, see Section 1.2 for the details of data format.

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:
>+025.12+020.45+012.78+018.97+003.24+015.35+008.07+014.79

Reads module 01 and receives the data in engineering format.

Command: #02 Response:
>4C532628E2D683A20F2ADBA16284BA71

Reads module 02 and receives the data in hexadecimal format.

Command: #03 Response:
>-9999.9-9999.9-9999.9-9999.9-9999.9-9999.9-9999.9-9999.9

Reads module 03 and the data is under range.

Related Commands:

Section 2.1 %AANNTTCCFF, Section 2.6 $AA2

Related Topics:

Section 1.2 Configuration Tables

2.3 #AAN, #AANN

Description:

Reads the analog input of channel N.

Syntax:

#AAN[CHKSUM](CR)

#	Delimiter character
AA	Address of the module to be read (00 to FF)
N	For differential mode, the channel to be read, zero based.
NN	For single-end mode, the channel to be read, zero based in hex format.

Response:

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

>	Delimiter character for a valid response
?	Delimiter character for an invalid response. An invalid command is returned if the specified channel is incorrect.
(Data)	Analog input data of the specified channel, see Section 1.2 for details of the data format.
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: #032 Response: >+025.13

Reads data from channel 2 of module 03.

Command: #0511 Response: >+025.13

Reads data from channel 17 of module 05 for an I-87017ZW in single-ended mode.

Command: #029 Response: ?02

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

Related Commands:

Section 2.1 %AANNTTCCFF, Section 2.6 $AA2

Related Topics:

Section 1.2 Configuration Tables

2.4 $AA0

Description:

Performs a span calibration.

Syntax:

$AA0[CHKSUM](CR)

$	Delimiter character
AA	Address of the module to be calibrated (00 to FF)
0	Command for the span calibration

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
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: $010 Response: !01

Performs a span calibration on module 01 and returns a valid response.

Command: $020 Response: ?02

Performs a span calibration on module 02. An invalid command is returned because the “enable calibration” command was not sent in advance.

Related Commands:

Section 2.5 $AA1, Section 2.14 ~AAEV

Related Topics:

Section 1.1 Calibration

Notes:

The “enable calibration” command, ~AAEV, must be sent before this command is used, see Section 1.1 for details.

2.5 $AA1

Description:

Performs a zero calibration.

Syntax:

$AA1[CHKSUM](CR)

$	Delimiter character
AA	Address of the module to be set (00 to FF)
1	Command for the zero calibration

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
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: $011 Response: !01

Performs a zero calibration on module 01 and returns a valid response.

Command: $021 Response: ?02

Performs a zero calibration on module 02. An invalid command is returned because the “enable calibration” command was not sent in advance.

Related Commands:

Section 2.4 $AA0, Section 2.14 ~AAEV

Related Topics:

Section 1.1 Calibration

Notes:

The “enable calibration” command, ~AAEV, must be sent before this command is used, see Section 1.1 for details.

2.6 $AA2

Description:

Reads the module configuration.

Syntax:

$AA2[CHKSUM](CR)

$	Delimiter character
AA	Address of the module to be read (00 to FF)
2	Command to read the module configuration

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
AA	Address of the responding module (00 to FF)
TT	Not used, should be 00.
CC	Baud Rate code of the module, see Section 1.2 for details.
FF	Data format, checksum settings and filter settings of the module, see Section 1.2 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: !01000600

Reads the configuration of module 01.

Command: $022 Response: !02000602

Reads the configuration of module 02.

Related Commands:

Section 2.1 %AANNTTCCFF

Related Topics:

Section 1.2 Configuration Tables

2.7 $AA5VVVV

Description:

Specifies the channel(s) to be enabled.

Syntax:

$AA5VVVV[CHKSUM](CR)

$ Delimiter character

AA Address of the module to be set (00 to FF)

5 Command to set the channel(s) to enabled

VVVV A four-digit hexadecimal value, where bit 0 corresponds to channel 0, bit 1 corresponds to channel 1, etc. When the bit is 1 it means that the channel is enabled and 0 means that the channel is disabled. Note: it is six-digit hexadecimal for I-87017ZW in single-ended mode.

Response:

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

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

! Delimiter character for a valid response

? Delimiter character for an invalid response. An invalid command is returned if an attempt is made to enable a channel that is not present.

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: $015003A Response: !01

Enables channels 1, 3, 4, and 5 and disables all other channels of module 01. The module returns a valid response.

Command: $016 Response: !01003A

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 2.8 $AA6

Note:

1. It is recommended that only the channels that will be used are enabled.
2. The command is $AA5VVVVVV for I-87017ZW in single-ended mode.

2.8 $AA6

Description:

Reads the enabled/disabled status of each channel.

Syntax:

$AA6[CHKSUM](CR)

$ Delimiter character

AA Address of the module to be read (00 to FF)

6 Command to read the channel status

Response:

Valid Response: **!AAVVVV[CHKSUM](CR)**

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

! Delimiter character for a valid response

? Delimiter character for an invalid response

AA Address of the responding module (00 to FF)

VVVV A four-digit hexadecimal value, where bit 0 corresponds to channel 0, bit 1 corresponds to channel 1, etc. When the bit is 1 it means that the channel is enabled and 0 means that the channel is disabled. Note: it is six-digit hexadecimal for I-87017ZW in single-ended mode.

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: $015003A Response: !01

Enables channels 1, 3, 4, and 5 and disables all other channels of module 01. The module returns a valid response.

Command: $016 Response: !01003A

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 2.7 $AA5VVVV

Note:

The format of the response is !AAVVVVVV for I-87017ZW in single-ended mode.

2.9 $AA7CiRrr

Description:

Sets the type code of a channel.

Syntax:

$AA7CiRrr[CHKSUM](CR)

$ Delimiter character

AA Address of the module to be set (00 to FF)

7 Command to set the channel range code

Ci i specifies the input channel to be set (0 ~ 9 for I-87017ZW). Note: i is a two digits in hex format (00 ~ 13) for I-87017ZW in single-ended mode.

Rrr rr represents the type code of the channel to be set. Refer to the Analog Input Type Setting table in Section 1.2 for details.

Response:

Valid Response: !AA [CHKSUM](CR)

Invalid Response: ?AA[CHKSUM](CR)

! Delimiter character for a valid response

? Delimiter character for an invalid response or invalid type code

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: $017C0R03 Response: !01

Sets the type code for channel 0 of module 01 to be 03 (-500~+500mV) and the module returns a valid response.

Command: $037C1R30 Response: ?03

Sets the type code for channel 1 of module 03 to be 30. The module returns an invalid response because the type code is invalid.

Related Commands:

Section 2.10 $AA8Ci

Related Topics:

Section 1.2 Configuration Tables

2.10 $AA8Ci

Description:

Reads the type code information of a channel.

Syntax:

$AA8Ci[CHKSUM](CR)

$ Delimiter character

AA Address of the module to be read (00 to FF)

8 Command to read the type code of a channel

Ci Specifies which channel to access for the type code information (i=0 ~ 9 for I-87017ZW).
Note: i is a two digits in hex format (00 ~ 13) for I-87017ZW in single-ended mode.

Response:

Valid Response: !AACiRrr[CHKSUM](CR)

Invalid Response: ?AA[CHKSUM](CR)

! Delimiter character for a valid response

? Delimiter character for an invalid response or invalid channel

AA Address of the responding module (00 to FF)

Ci Specifies which input channel to access to retrieve the type code information.

Rrr Represents the type code of the specified input channel. Refer to the Analog Input Type Setting table in Section 1.2 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: $018C0 Response: !01C0R02

Reads the channel 0 input range of module 01 and returns 02 (-100~+100mV).

Related Commands:

Section 2.9 $AA7CiRrr

Related Topics:

Section 1.2 Configuration Tables

2.11 $AAA

Description:

Reads the data from every analog input channel in hex format.

Syntax:

$AAA[CHKSUM](CR)

$ Delimiter character
AA Address of the module to be read (00 to FF)
A Command to read every analog input

Response:

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

> Delimiter character for a valid response
? Delimiter character for an invalid response
(Data) Data from every analog input channels in hex format.

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: $01A

Response: >0000012301257FFF1802744F98238124

Reads module 01 and receives the data in hex format.

Related Commands:

Section 2.2 #AA

2.12 $AAF

Description:

Reads the firmware version of a module.

Syntax:

$AAF[CHKSUM](CR)

$	Delimiter character
AA	Address of the module to be read (00 to FF)
F	Command to read the firmware version

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
AA	Address of the responding module (00 to FF)
(Data)	A string indicating the firmware version of the module

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.

2.13 $AAM

Description:

Reads the name of a module.

Syntax:

$AAM[CHKSUM](CR)

$	Delimiter character
AA	Address of the module to be read (00 to FF)
M	Command to read the module name

Response:

Valid Response:	!AA(Name)[CHKSUM](CR)
Invalid Response:	?AA[CHKSUM](CR)

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
AA	Address of the responding module (00 to FF)
(Name)	A string showing the name of the module

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: !0187017Z

Reads the module name of module 01 and returns the name “87017Z”.

Related Commands:

Section 2.15 ~AAO(Name)

2.14 ~AAEV

Description:

Enable/Disable module calibration.

Syntax:

~AAEV[CHKSUM](CR)

~	Delimiter character
AA	Address of the module to be set (00 to FF)
E	Command to enable/disable calibration
V	1: enable calibration 0: disable calibration

Response:

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

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
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: $010 Response: ?01

Sends the command to perform a span calibration on module 01. It returns an invalid response because the "enable calibration" command was not sent in advance.

Command: ~01E1 Response: !01

Enables calibration on module 01 and returns a valid response.

Command: $010 Response: !01

Sends the command to perform a span calibration on module 01 and returns a valid response.

Related Commands:

Section 2.4 $AA0, Section 2.5 $AA1

Related Topics:

Section 1.1 Calibration

2.15 ~AAO(Name)

Description:

Sets the name of a module.

Syntax:

~AAO(Name)[CHKSUM](CR)

~ Delimiter character

AA Address of the module to be set (00 to FF)

O Command to set the module name

(Name) New name of the module (max. 6 characters).

Response:

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

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

! Delimiter character for a valid response

? Delimiter character for an invalid response

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: ~01O87017A Response: !01

Sets the name of module 01 to be “87017A” and returns a valid response.

Command: $01M Response: !0187017A

Reads the name of module 01 and returns “87017A”.

Related Commands:

Section 2.13 $AAM

2.16 ~AARD

Description:

Reads the response delay time.

Syntax:

~AARD[CHKSUM](CR)

~	Delimiter character
AA	Address of the module to be set (00 to FF)
RD	Command to read the response delay time

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
AA	Address of the responding module (00 to FF)
VV	Two hexadecimal digits to represent the delay time value in ms, for example 01 means 1ms and 1E means 30ms.

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: ~01RD Response: !0101

Reads the response delay time of module 01 and returns 01, meaning that the response delay time is 1ms.

Related Commands:

Section 2.17 ~AARDVV

2.17 ~AARDVV

Description:

Sets the response delay time.

Syntax:

~AARDVV[CHKSUM](CR)

~	Delimiter character
AA	Address of the module to be set (00 to FF)
RD	Command to set the response delay time
VV	Two hexadecimal digits representing the response delay time in ms. The max delay time is 30ms.

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
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: ~01RD0A Response: !01

Sets the response delay time of module 01 to 10ms and returns a valid response.

Related Commands:

Section 2.16 ~AARD

2.18 ~**

Description:

Informs 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 2.19 ~AA0, Section 2.20 ~AA1, Section 2.21 ~AA2, Section 2.22 ~AA3EVV

Note:

After sending this command, there must be a 2ms delay before the next command can be sent.

2.19 ~AA0

Description:

Reads the host watchdog status of a module.

Syntax:

~AA0[CHKSUM](CR)

~ Delimiter character

AA Address of the module to be read (00 to FF)

0 Command to read the module status

Response:

Valid Response: **!AASS[CHKSUM](CR)**

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

! Delimiter character for a valid response

? Delimiter character for an invalid response

AA Address of the responding module (00 to FF)

SS Two hexadecimal digits that represent the host watchdog status, where:
Bit 7: 0 indicates that the host watchdog is disabled and 1 indicates the host watchdog is enabled,
Bit 2: 1 indicates that a host watchdog time out has occurred and 0 indicates that no host watchdog time out has occurred.
The host watchdog status is stored in EEPROM and can only be reset 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 host watchdog status of module 01 and returns 00, meaning that the host watchdog is disabled and no host watchdog time out has occurred.

Command: ~020 Response: !0204

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

Related Commands:

Section 2.18 ~**, Section 2.20 ~AA1, Section 2.21 ~AA2, Section 2.22 ~AA3EVV

2.20 ~AA1

Description:

Resets the host watchdog time out status of a module.

Syntax:

~AA1[CHKSUM](CR)

~	Delimiter character
AA	Address of the module to be set (00 to FF)
1	Command to reset the host watchdog time out status

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
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: ~010 Response: !0104

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

Command: ~011 Response: !01

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

Command: ~010 Response: !0100

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

Related Commands:

Section 2.18 ~**, Section 2.19 ~AA0, Section 2.21 ~AA2, Section 2.22 ~AA3EVV

2.21 ~AA2

Description:

Reads the host watchdog time out value of a module.

Syntax:

~AA2[CHKSUM](CR)

~	Delimiter character
AA	Address of the module to be read (00 to FF)
2	Command to read the host watchdog time out value

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
AA	Address of the responding module (00 to FF)
E	1: the host watchdog is enabled 0: the host watchdog is disabled
VV	Two hexadecimal digits to represent the time out value in tenths of a second, for example, 01 means 0.1 seconds and FF means 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 time out value of module 01 and returns FF, meaning that the host watchdog is enabled and the host watchdog time out value is 25.5 seconds.

Related Commands:

Section 2.18 ~**, Section 2.19 ~AA0, Section 2.20 ~AA1, Section 2.22 ~AA3EVV

2.22 ~AA3EVV

Description:

Enables/disables the host watchdog and set the host watchdog time out value of a module.

Syntax:

~AA3EVV[CHKSUM](CR)

~	Delimiter character
AA	Address of the module to be set (00 to FF)
3	Command to set the host watchdog
E	1: enable the host watchdog 0: disable the host watchdog
VV	Two hexadecimal digits to represent the time out value in tenths of a second, for example, 01 means 0.1 seconds and FF means 25.5 seconds.

Response:

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

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
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: ~013164 Response: !01

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

Command: ~012 Response: !01164

Reads the host watchdog time out value of module 01. The module returns 164, meaning that the host watchdog is enabled and the host watchdog time out value is 10.0 seconds.

Related Commands:

Section 2.18 ~**, Section 2.19 ~AA0, Section 2.20 ~AA1, Section 2.21 ~AA2

2.23 @AAS

Description:

Reads the differential/single-ended connecting mode status.

Syntax:

@AAS[CHKSUM](CR)

@	Delimiter character
AA	Address of the module to be read (00 to FF)
S	Command to read the connecting mode

Response:

Valid Response: !AAN[CHKSUM](CR)
Invalid Response: ?AA[CHKSUM](CR)

!	Delimiter character for a valid response
?	Delimiter character for an invalid response
AA	Address of the responding module (00 to FF)
N	Current connecting mode 0: differential mode 1: single-ended mode

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: @01S Response: !010

Reads the connecting mode of module 01 and returns a response of 0 meaning that it is in differential mode.

Revision History

Revision	Notes
1.0 2011/05/16	Initial release
1.1 2015/11/11	Remove incorrect data in type code 0D fields of the Analog Input Type and Data Format Table