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How to Use the Checksum Feature

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A checksum helps you to detect errors in commands from the host to the modules, and in responses from the modules to the host. The feature adds two extra checksum characters to the command or response string, which does reduce the throughput.

D.1 Checksum Enable/Disable

To enable configuration of a module's checksum feature, its INIT* terminal should be shorted to its GND terminal, after which the module should be rebooted. The checksum feature is enabled by setting bit 6 of the data format/checksum parameter to 1. To disable the checksum, set the parameter to 0. Remember that when using the checksum feature, it should always be enabled for all connected devices including the host computer.

The checksum is represented by a 2-character ASCII hexadecimal format and is transmitted just prior to the carriage return. The checksum equals the modulo-256 (100h) sum of all the ASCII values in the command preceding the checksum. If the checksum in a command is missing or incorrect the module will not respond.

Example 1

The following is an example of an Analog Data In command and response when the checksum is enabled:

Command: #05S10C(cr)

Response: +3.56719D(cr)

The input value at the module in slot 1 of the ADAM-5000 systems at address 05h is +3.5671 V. (The date format is engineering units.) The command checksum (0Ch) is the sum of the ASCII values of the following characters: #, 0, 5, S and 1. The response checksum (9Dh) is the sum of the ASCII values of the following characters: ">" "+" "3" "4" "5" "6" "7" and "1"

Example 2

This example explains how to calculate the checksum value of a Read High alarm limit command string:

Case 1. (If the Checksum feature is **disabled**)

Command: $07S1RH(cr)

Response: !07+2.0500(cr) when the command is valid.

Case 2. (If the Checksum feature is enabled)

Command: $07S1RHA9(cr)

Response: !07+2.0500D8(cr)

where:

A9 represents the checksum of this command, and<R>D8 represents the checksum of the response.

The checksum of the command string is derived as shown below:

A9h = (24h+ 30h + 37h + 53h + 31h + 52h + 48h) MOD 100h

The hexadecimal ASCII codes for $, 0, 7, S, 1, R and H are 24h, 30h, 37h, 53h, 31h, 52h and 48h respectively. The sum of these ASCII codes is 1A9h. The modulo-256(100h) - of 1A9h is A9h.

Printable ASCII Characters

HEX	ASCII	HEX	ASCII	HEX	ASCII
		40	@	60	`
21	!	41	A	61	a
22	"	42	B	62	b
23	#	43	C	63	c
24	$	44	D	64	d
25	%	45	E	65	e
26	&	46	F	66	f
27	'	47	G	67	g
28	(	48	H	68	h
29	)	49	I	69	i
2A	*	4A	J	6A	j
2B	+	4B	K	6B	k
2C	,	4C	L	6C	l
2D	-	4D	M	6D	m
2E	.	4E	N	6E	n
2F	/	4F	O	6F	o
30	0	50	P	70	p
31	1	51	Q	71	q
32	2	52	R	72	r
33	3	53	S	73	s
34	4	54	T	74	t
35	5	55	U	75	u
36	6	56	V	76	v
37	7	57	W	77	w
38	8	58	X	78	x
39	9	59	Y	79	y
3A	:	5A	Z	7A	z
3B	;	5B	[	7B	{
3C	<	5C	]	7C	|
3D	=	5D	\	7D	}
3E	>	5E	^	7E	~
3F	?	5F	_		