



MODBUS/ASCII based protocol:

Supported MODBUS/ASCII function codes: 3-read holding, 4-read input, 6-write single, 16-write multiple, 17-slave identification. See <http://www.modbus.org/specs.php> for more information on using MODBUS function codes to read and write registers. Note: no parity is used by default.

Model	Default Parameters	Default Prefix	Default Postfix
RS232 (Full Duplex) and RS485 (Half Duplex)	9600, 8, N, 1	":01" (0x3A3031)	CRLF (0x0D0A)

Tri-Tronics DCS™ protocol: (Alternate, custom, simplified protocol)

Primary Commands	Request Format	Response Format	Notes
Read Single	r{address}	r{address}{value}	{address}, {value(s)}, {quantity} are 16-bit words (4 characters)
Read Multiple	r{address}{quantity}	r{address}{value(s)}	
Write Multiple	w{address}{value(s)}	w{address}{value(s)}	

Invalid commands are ignored. Read Single/Multiple returns 65535 (0xFFFF) for unimplemented registers. The write command indicates an invalid address or value by halting the write command at the first error and only echoing the values that were successfully written. Therefore, you should check the length of the response to verify all values were accepted. Attempting to write more than 48 contiguous registers at a time is not supported.

Protocols	Command Structure
MODBUS/ASCII based	{prefix/address}{function code}{hexadecimal data}{LRC}{postfix} Example: :010620000003D6{CRLF}
Tri-Tronics DCS™	{prefix}{command character}{hexadecimal data}{postfix} Example: :01w20000003{CR}

Additional Tri-Tronics DCS™. Protocol Commands

F - Requests the firmware and serial number

Returns: **Fvrrbbssssss** where **vv** is the version number, **rr** is the revision number, **bb** is the build number, and **ssssss** is the serial number.

B - Requests the indicator statuses and bargraph value

Returns: **Bxy** where **y** is the bargraph value ranging from 0 to A (Bar 0 to Bar 10), and **x** contains 4 independent bits: {reserved}{reserved}{action alert}{output}. A return value of **B1A** would indicate that the sensor is at a bar 10 and the output is on.

v - Requests the signal strength

Returns: **vxxxx** where **xxxx** is the digital signal strength.

Lxx - Sets the detect mode

Values for **xx**: 01 - Light "On", 00 - Dark "On", or omit to query.

Pxx - Sets the output mode

Values for **xx**: 01 - Invert, 00 - Normal, or omit to query.

Jxx - Controls the Automatic Contrast Tracking feature

Values for **xx**: 01 - enables A.C.T., 00 - disables A.C.T., or omit to query.

Hxx - Controls the Hysteresis setting. (Deprecated, see Register 0x0302)

Values for **xx**: 01 - high, 00 - low, or omit to query.

Ixx - Initiate autoset

Values for **xx**: 01 - Light State Set, 00 = Dark State Set, or omit to use the previously selected mode.

Axx - Manual adjust (like push buttons on Smarteye Pro)

Values for **xx**: 01 - Adjust Up, 00 - Adjust Down. An Adjust Up ☐ increases the signal strength ☐; this is accomplished by decreasing the threshold values. It typically increases the contrast value by one bar.

0000			Sensor Info						
0000	0	40001	Device ID	R	32	64	Byte[64]	Factory Data	
0020	32	40033	Firmware	R	2	4	Int32	00.Int24	
0022	34	40035	Build	R	2	4	Int32	00.Int24	
0024	36	40037	Serial Number	R	2	4	Int32	00.Int24	
0080	128	40129	Sensor Status	R	1	2	Bit(16)	{error}, Delta Settings (as of 03.00.43), Action Alert, {null}, AUX, Secondary, Primary,	
0081	129	40130	Signal	R	1	2	Int16	Detect; {null:4}, bargraph:4 (1-A)	
0100			Sensor Global Configuration						
0100	256	40257	Button Lockout	R/W	1	2	Int16	0-Normal, 1-Locked	
0101	257	40258	Memory Location	R/W*	1	2	Int16	Active Mem: 1-5	
0102	258	40259	AUX Mode	R/W	1	2	Int16	-1 - Remote AUTOSET, 0 - Output, Off, 1 - Output, On, 2/3 - Action Alert Output, 16/17 Remote Input	
0103	259	40260	Rear Indicator Mode	R/W	1	2	Int16	-1 - Automatic, 0 - Set Off, 1- Set On, 4-Always Off, 5-Normal Off, Now On, other - reserved	
0200			Communications						
0201	513	40514	Baud	R/W*	1	2	Int16	300 to 57600 Baud	
0202	514	40515	Prefix	R/W*	2	4	Byte[4]	Right Aligned Char Array	
0204	516	40517	Postfix	R/W*	1	2	Byte[2]	0x000D - CR, 0x0D0A - CRLF	
0211	529	40530	Prefix: Device Address	R/W*	1	2	Int16	-1 - N/A, 1-255 address	
0300			Configuration						
0300	768	40769	Response Time	R/W*	1	2	Int16	60μs (High Speed), 125μs (Standard), or 450μs (Long Range / High Resolution)	
0301	769	40770	AUTOSET: Set Point %	R/W	1	2	Int16	10% - Low Contrast, 20% High Contrast	
0302	770	40771	AUTOSET: Hysteresis	R/W	1	2	Int16	1-Normal, 4 - 4x Hysteresis (See EyewareXPC Help for details)	
0303	771	40772	AUTOSET: Mode	R/W	1	2	Int16	2 - Light State, 0 - Dark State, {reserved: 4 - Midpoint, 8 - Two Point}	
0304	772	40773	Detect Mode	R/W	1	2	Int16	1 - Light On, 0- Dark On	
0305	773	40774	Automatic Contrast Tracking	R/W	1	2	Int16	0-Disabled, 1-Enabled	
0306	774	40775	Output Mode	R/W	1	2	Int16	0-Normal, 1-Inverted, other-reserved	
0400			Post-Processing						
0400	1024	41025	Conditioning Options	RW	1	2	Int16	0-Normal, 1-Leading Debounce, 2-Trailing Debounce, 3-Leading & Trailing Debounce	
0401	1025	41026	Leading Edge Timer (ms)	RW	1	2	Int16	0 - 1500ms (error if value > 1677)	
0402	1026	41027	Trailing Edge Timer (ms)	RW	1	2	Int16	0 - 1500ms (error if value > 1677)	
0403	1027	41028	Blind Timer (ms)	RW	1	2	Int16	0 - 1500ms (error if value > 1677)	
0500			Dynamics						
0500	1280	41281	Light State	R	1	2	Int16	Light State Switch Point	
0501	1281	41282	Dark State	R	1	2	Int16	Dark State Switch Point	
0502	1282	41283	Switch Point	R/W	1	2	Int16	Centered Switch Point	
1000			Recipe Control						
1000	4096	44097	Recipe	R/W	48	96	Byte[96]	Loads recipe upon reading first register, Writes recipe upon receiving last register	
2000			Actions						
2000	8192	48193	Autoset/Quickset	W!	1	2	Int16	-1-AUTOSET, (AUTOSET Mode Detect Mode) - Quickset Repeats last AUTOSET (Quickset configures Output and AUTOSET Mode, then performs AUTOSET)	
2001	8193	48194	Adjust	W	1	2	Int16	+- Tap Adjustment: 1 - Tap Up, -1 Tap Down	