PulseView

Index Cell 1 Cell 2 Cell 3 Cell 4 Goals Projects

Saturday, December 23, 2023 2:36 PM

https://sigrok.org/wiki/Downloads

Open source tool for analyzing various protocols including modbus $% \left(\frac{1}{2}\right) =\frac{1}{2}\left(\frac{1}{2}\right)$

 $\frac{\text{https://learn.sparkfun.com/tutorials/using-the-usb-logic-analyzer-with-sigrok-pulseview/exploring-the-capabilities}$

Here's a fun sparkfun walkthrough of the tool and a link for a usb c version of the logic analyzer.

After a lot of troubleshooting a discovered that even at around double the sampling rate of 9600 baud, I was still getting inaccurate packets. So far it has been working at 25ks/s. Take the readings with a grain of salt but if sending a basic check packet to read the temperature

https://www.modbustools.com/modbus.html

This is the best reference I found to look at how the modbus proto is constructed for simple reg reads

https://minimalmodbus.readthedocs.io/en/stable/ https://minimalmodbus.readthedocs.io/en/stable/ modules/minimalmodbus.html

Docs for minimal modbus because vscode intellisense seems to only work 10% of the time... so that's a bummer

Request		
he request message specif	hes the starting register an	
bearing of a respect to res	et 0 1 Consister 40001 to	400021 from slave device 1:
Field Name	RTU (hex)	ASCII Characters
Function		
Starting Address Lo		
Quantity of Registers Hi		
Quantity of Registers Lo		
Error Check Hi		
Trailer		
Total Bytes		
Response The register data in the responsery contents right sustific	porse message are packed of within each byte. For ea	as two bytes per register, with the
The register data in the resp	ed within each byte. For ea cond contains the low-order	i as two bytes per register, with the
The register data in the responsery contents right justific sigh-order bits, and the sec Example of a response to the	ed within each byte. For ea cond contains the low-order	i as two bytes per register, with the
The register data in the responsery contents right swiffly sinery contents, right swiffly sigh-order bits, and the sec Example of a response to the Field Name	d within each byte. For ea ond contains the low-order re request:	I as two bytes per register, with the ch register the first byte contains t r bits.
The register data in the responsive contents right justified sigh-order bits, and the sec-	d within each byte. For ea and contains the low-order te request: RTU (Nex)	as two bytes per register, with the ch register the first byte contains t bits. ASCII Characters
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The register data in the rea sinary contents right justific high-order bits, and the sec Example of a response to the Field Manne Header Slave Address Function	id within each byte. For as ond contains the low-order ie request: RTU (hex) None 01 03	i as beo bytos per registor, with the chi register the first byte contains to be. ASCII Characters 1 (Golon) 0 1 0 3
The register data in the rus insery contents right justifi- high-order bits, and the sec boungle of a response to the Field Manne Header Stark Address Function Byte Count, Date H	ad within each byte. For each condition of the low-order in request: RTU (hex) None D1 D3 D4	as two bytes per regular, with the chrequiter the first byte contains to bits. ASCEL Characters (color) 0 1 0 3 0 4
the register data in the ros innersy contents right, susfit high-order bits, and the sec boungle of a response to the Field Manne Header Slave Address Function Byte Count Data Hi Data Hi Data La	id within each byte. For as and contains the low-order le request: RTU (hex) None 01 03 04 00	as two bytes per regalor, with the chregister the first byte contains to the. ASCEL Characters (Collect) 0.1 0.3 0.4 0.0
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The register data in the reason invary contents right putfill sigh-order bits, and the sec- cessingle of a response to the Field Name Header Saver Addresso Function Byte Court Data Hi Data III Data III Dat	of within each byte. For as nond contains the low-order ic request: RTU (hex) Notic 01 03 04 00 00 00	I as boo byten per register, with the ch register that first byte contains to bits. ASCEI Characters Coneco 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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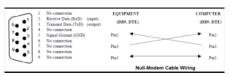
SUCCESS we have a perfectly captured send and receive...

This took like 3 weeks to figure out..

Hardware







So just put the TX from pin 3 on DB9 to A0 of logic analyzer and pin 2 RX to A2.

<u>PulseView Setup</u>

run setup executable

after setup this program is also installed which sets up the WCID, driver which is a common universal windows ID driver to automatically ID usb devices $\begin{tabular}{ll} \hline \end{tabular}$



Select list devices to install the specific device that the logic analyzer firmware works with the device refers to the chip set installed (cypress fx2)

Launching pulseview should automatically populate the device with Salae hardware, which is the compatible version $\,$

choose protocol decoders at the top and load the modbus rtu protocol with UART RX/TX mode enabled $\,$



these are the modbus settings
APPARENTLY CRITICAL, set the sample rate to be > 20kHz!!

L N samples - St Hib - 100

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Kepnare Ma Medico Re	dius lative (Drawload				Read		
Medius No Number No 400001	mber (Order In Sethware Defined As	Porumeter	Page Factory	Menu-Pathway Dispressio		Range (value in decimal via Meditus)	
400002	1	Order In Software Defined As MODEL, RES SERVAL, MUNIS, L. PIECS SERVAL, MUNIS, J. PIECS	Model Serial Number (first part) Serial Number (second part)	Factory	Diagnostic	1	Range (relate in decimal vis Moethos) (344: PED, ACC (74 seri as 4F (000000 to 900000) (000000 to 900000)	
400003 400004	3	SERAL, MARIE, JADOS SOTTANAS, MARIES, SAD SOTTANAS, PAY, PER SOTTANAS, PAY, PAY, PAY, SOTTANAS, PAY, PAY, SOTANAS, PAY, SOTANAS, PAY, SOTANAS, PAY, SOTANAS, PAY, SOTANAS, PAY, SOTANAS, PAY, SOTA	Senal Number (second part) Software Number	Factory Factory	Diagnostic Diagnostic	-		
400005 400000	4.	MAD DATE MED	Revenue Manufacturing Date	Feeting People's	Dagnostis Dagnostis	1	(C to MM) to hardwall in	
400009 400010	8	MPUT 1 HW REG	Input 1 Hardware Input 2 Hardware	Pactory Factory	Diagnostic Diagnostic		16 to 2009	
400011 400017	10	INPUT_1 HW_REG	Input 2 Hardware Input 3 Hardware Output 14 Hardware Output 15 Hardware Output 25 Hardware Output 25 Hardware Output 25 Hardware Ret arrowsh 1 Hardware Ret arrowsh 2 Hardware Sase Changes to EIII	Factory Factory	Diagnostic Diagnostic	1	(O) None, (B) Univ Dual	
	10 10 10 18 19 20 21 25	OUTPUT_1_HW_REG OUTPUT_2_HW_REG	Output 18 Hantware Output 18 Hantware	Fastory Fastory	Diagnostic Diagnostic	-	(2) SSR, (3) DC, (4) Process (C) None, (2) SSR, (3) DC, (4) Process	
400019 400020 400021 400022 400026	16	OUTPUT 3 HW REG	Output 2A Hentware Output 2B Hentware	Festory Pactory Pactory Factory rome	Diagnostic	-	(5) None, (2) SSR, (3) DC, (4) Process (5) None, (2) SSR, (3) DC, (4) Process	
400021	20	OUTPUT 5 HW REG	Retorated 1 Hardware	Pactory	Degrowtie	1	(O) None, (4) Process	
400000	25	605 WRITE_DATA_TO_SE_REG	Same Changes to Elli	nane	rarie.	*	() Size	
400001 400101	30 100	E0	Software Solid	rere rere	Term Stehn	7	(100 to 32/67) in hundreline	
		ACTUAL 1 REG	Input 1 Process Value	rene		*	190 to 2/567 in hundrells. 120/8 to 3/270 in Hunger, Herbin, hundrells or thoseerdiffs. 5/1 None. (1/1 AboU Order Flow, C2 Servor Under Range, U2 Servor Cher Range, (4) AboU Over Flow, I5/1 AboU Timeout.	
400102	101	INPUT_1_ERROR_REG	Input 1 Error Status	nane	Status	ř.	(5) Open Loop (5) Off. (1) Alarm High. (2) Alarm Low. (3) High Latched Alarm. (4) Low Latched Alarm. (5) High Silenced Alarm, (6) Low	
	17760	70.00000442	\$2000apa		Lauren C		Selected Alarm, (7) High Latined Silenced Alarm, (8) Low Latched Silenced Alarm, (9) Walting for in Range Alarm, (10) District Alarm, (11) Grow Alarm	
400103 400104	132 133 134	ALAMA 1 REG OUTPUT 1 FOWER REG ACTUAL 2 REG	Alarin 1 Status % Power Output 1A Input 2 Process Value	rene rene Male	Plates Tietre	-		
400105					Status		\$10 to NOWN FOREIGN. 1-32786 to STREY's in risinger, tenths, hundrefins or thousandths. [52 Stone, (1) AlsO Under Flow, [2] Sensor Under Range, (3) Sensor Over Range, (4) AlsO Over Flow, (5) AlsO Timeous, 60 Street Nown	
400100	195	IMPUT_2_ERROR_REG	Vigue 2 Error Status	none .	Stellus	*	(6) Open Loop (6) Off. (1) Allem High. (3) Allem Low. (3) High Latched Alams. (6) Low Latched Alams. (5) High Silverced Alams. (6) Low	
200107		110000000	0.222		10.0		Sleeced Alam, (7) High Latured Silenced Alam, (8) Low Latched Sleeced Alam, (6) Walting for in Range Alam, (12)	
400100 400100	196 137 198	ALAMM_Z PER OUTPUT Z POWER_PER ACTUAL_3 PER	Alern 2 Status % Power Output 15 Input 3 Process Value	rene	Stetue Stetue	+	Diseased Asiam, (11) Crox Asiam (0 to 1000)N in tenths	
		ACTUAL 3 PEG	Input 3 Probles Value	nene		7	(-32768 to 32767) in image, tenths, hundreths or thousand the (it No Errors, (1) AID Linderflow Error, (2) Sensor Underrange Error, (3) Sensor Owenings Error, (4) AID Overflow Error,	
400110	109	INPUT_3_ERROR_REG	Input 3 Error Status In Private Curtist St.	none none nere	Steam	5	(S) A/D Timeout Sinor. (E) Open Loop Detact Sinor	
400110 400110 400116 400201	109 111 116 290 291 294 295	OUTPUT A POWER RESI	% Power Output 28	rene	Status Status Status Status	í.	(0) for 1000(% or bendle	
	201	EVENT_STATUS_1_TED	Digital Input 1 Status	rene		7	IO Los. (1) High	
400205 400206	294 295	PROP_TERM_1_REG	Proportional Tenn Channel 1A.	none none	Tone Tone Tone	1	-1000 to 1000 in tenths % Power	
400008	297 297 210 213	OFFICE J. TOPICS J. TEST OFFICE J. TEST OFFI OF	Input 3 Error Status 16 Power Output 28 16 Power Output 28 Operation Mode Digital Power 1 Status PID Power Channel 1 Propositional Term Channel 14 Notegoal Service Channel 15 Densetive Term Channel 15 Densetive Term Channel 15	none	Terrer Cerrer	-	Sign Control (April 2014) A control (April 20	
400211 400214	210	OPEN LOOP ERROR 1 RED EVENT STATIS 2 RED	Input 1 Open Loop Status Double book 2 Status	Moin Main	Stellan Stellan		(O) Off, (1) On (C) (on . 1) High	
40021T 400210	216	PO POWER 2 REG	Input 1 Open Large Ballon Digital Reput 2 Status PID Power Channel 1 Proportional Tenn Channel 18	none	none	1	(5) OR (1) Co. (5) Low (1) Night 1-3000 to 10000 in Section Ni Power 1-3000 to 10000, in section Ni Power 1-3000 to 1000, in section Ni Power	
400219	216	INTEGRAL_TERM_2_REG	Propostional Term Channel 18 Integral Term Channel 18 Decide Yeris Channel 18	none none none none none none none none	norm norm norm norm Status	+	1 1000 to 1000) in tenths % Power	
400220	216 222 226 226 229 230 231 237 241	OPEN LOOP_ERROR_2_REG	Declarior Territor 19 Imput 2 Open Long States Digital Imput 3 District 19 Phi Onese Change 2 Propositional 2 A Imput 3 District 19 Propositional States 2 A Imput Imput 4 States 19 Propositional Committee 2 Imput Imput 4 States 19 Propositional Territor 19 Imput Imput 4 States 19 Proposition Territor Observat 25 Indigital Territor 10 See Point 1 States Change 23 America 1 Long Marine and England America 1 Long Marine and Refer Sequence 1 Long Marine and Refer Sequence Se	rone	Tiese Stesse	-	1-9000 to 1000) in territo %. Power	
400226 400229	226	EVENT STATUS 3 REG	Digital Input 3 Status ISO Preser Channel 7	rene	Trebe		(O) Low, (1) High 1, 2000 to 10000 in facility % Bosser	
	229	PROP_TERM_3_REG	Proportional Term Channel 3A	none	none	+	I 9000 to 9000) in tenths % Power	
400231 400231	331	DERVATIVE_TERM_1_REG	Decative Term Charmel 2A	nene	ranke		95 OH, CT ON- (Si Use, 11) High (Si Use, 11) High (Si Use, 11) High (1900) to 9000 je dentha 'S Power	
400342	241	PROP TERM 4 REG	Digital Input 4 Status Proportional Term Channel 25	none	Tone		(5) Low, (1) High 1-1000 to 1000) in tentito % Power	
400343 400343 400343 400344 40001	243	DERVATVE TORM A REG	Integral Term Channel 25 Derhative Term Channel 25	none .	TOTAL TOTAL	-	1 1/1000 for 3/000, in senten in Silvaner (5) (inc., 15) (wight 1-1000 for 3/000 in senten in Promer 1-1000 for 3/000 in senten in Promer 1-1000 for 3/000 in senten in Promer 1-1000 for 3/000 ju senten in Promer (5) (inc., inc.,	
400301 400303	300	580 SP_1 REG	Set Point 1, Static	Main Operations	Stetue Alarm Set Points	678	(SPI Low Limit to SPI High Limit)	
400303	302	Sel ALARM, SP J.DW, 1,REG	Ataris 1 Los Process Seguito	Operations	Alarm Set Points	10) 10866 to -1) degrees or ands sper sensors to Alarin 1 High Set Polet.	
400503	302	SAT ALARM, SP_LOW_1, REG	Setpoint	Operations	Alarm Set Points	t'm	1-19090i tr. Alarm T. Maximum Rafe High -1	
400304	303	SIT ALARM, SP_LOW_1, REG SIG ALARM, SP_HIGH_1, REG SIG ALARM, SP_HIGH_1, REG	Alaste 1 High Davistion Selpoint Alaste 1 High Process Selector	Operations Operations	Alarm Set Points Alarm Set Points	rie rie	if to 2000) degrees or sints "per sensor" to Alarm 1 Low Set Point.	
400004		500 At ADM 500 MIGHT 1 0000	Alam 1 High Process Setpoint Alam 1 High Maximum Rate Setucid	Operations	Alarm Set Ponts	14	Alama S. Lou Mannero Data et la 19000	
400305 400305	303 304 305 305 306 211 312 313 319 321 321	BO ALASM, SP JAGH, 1, REG 396 ALTOTURE, SP J. REG 775 ALTOTURE, STATT, JREG ALTOTURE, STATT, JREG ALTOTURE, STATT, JREG CLEAP, KROCKET, JREG CLEAP, KROCKET, JREG SS SP J. REG SS SP J. REG SS JAGE ALASM, JREG SS JAGE ALASM, JREG SS JAGE ALASM, JREG SS JAGE ALASM, JREG SS JAGE ALASM, JR. LOW, J. REG SS JAGE ALASM, JR. LOW, J. REG SS JAGE ALASM, JR. LOW, J. REG	Sepont Channel 1-Autoture Set Point Autoture PID	Operations Setup Operations Setup name name Mare Operations	Agente > Value Autoure PD Autoure PD System > Power-Out Action Hey Press Simulation Hey Press Simulation Hey Press Simulation Hey Press Simulation	19	(SE to 190%	
	305	AUTOTUNE_START_1_REG	Cescade Inter Loop	Operations	Autoture PID	1'0	(i) Tues Off, (i) PD Set 1, (i) PD Set 2, (i) PD Set 3, (4) PD Set 4, (5) PD Set 5	
400309	300	CLEAR ERROR REG	Ide Set Point Chansel 1 Gear Stoy 1	Setup	System = Power-Out Action Hay Press Simulation	I'W	(SP Line Limit to SP High Limit) ente any value	
400309 400309 400302 600303 600304 400320 400322	312	CLEAR ALARM 1 REG	Icle Set Florid Channel I Clear Stor I Clear Alarin 1 Sterice Alarin 1 Set Point 2, Stello Alarin 2 Low Division Setpoint Alarin 2 Low Process Setpoint Alarin 3 Low Maximum Paire Septoint	none	Key Press Sinulation Key Press Simulation	*	(86 to 1865) 2. Sept. 01 (10 to 170 be 1, 0) 0.0 170 be 1, 0 (0 to 170 be 1, 0 to	
400320	319	589 SP_2_REG	Set Port 2, State	Mare	Status Alarm Set Points Alarm Set Points	1/6 1/6 1/8	ISP2 Low Limit to SP2 High Limit)	
400322	321	552 ALARM SP_LOW_2_REG	Alam 2 Low Process Selpoint	Operations	Alarm Sel Points	19	*per sensor* to Alarin 2 High Set Point	
400322	321	SSS ALARM SP LOW 2 REG	Alarra 2 Loe Maximum Rate Sequint Alarra 2 High Deviation Sequint	Operations	Have Set Points	s'w) 19699) tu Alam 2 Maureum Rate High -1	
400323 400323	322 322	SSS ALARM SP LOW 2, REG SSS ALARM SP J48H 2, REG SSS ALARM SP J48H 2, REG	Alams 2 High Deviation Sequent Nams 2 High Process Salacost	Operations	Alarm Set Points Alarm Set Points Alarm Set Points	1/4 1/4 1/4	1990K) to Alazin 2 Maximum Rate High -1 To 2000th degrees or write -Sept setember 1 Alamin 2 Law 3et Prost	
400323	322		Alors 2 High Process Selection Alors 2 High Maximum Nate	Operations			Atem 2 Low Maximum Rate +1 to (30000)	
400324 400325	323 324	506 ALARM SP HIGH 2 FEG 507 ALFOTTING SP 3 FEG 602 ALFOTTING START 2 FEG 505 ISLE SETPONT 2 FEG	Setpoint Charmel 2 Autotune Set Point	Setup Operations	Southern in high as	t'e t'e	(55 to 150)N (0) Supp OR (1) Ch 2 PID Set 6, (2) Ch 3 PID Set 7, (3) Ch 2 PID Set 8, (4) Ch 2 PID Set 9, (5) Ch 2 PID Set 16	
400320	327	365 DLE_SETPONT_2_REG	Channel 2 Autotune Idle Set Point Channel 2	Gas.m.				
400331 400332	330 331	CLEAR ALARM 2 REG	Gee Ever 2 Geer Alem 2 Stence Alem 2	rone rone rone	Key Press Simulation Key Press Simulation	*	and the party selluter writtee array selluter 2-to 1-0 00000	
400333 400344	332 343 349	CLEAR FRONT Z REG CLEAR FARM Z REG SLENCE ALARM Z REG 63 COCO ALTONNE START REG CLEAR ERROR J REG	Stence Alam I Cascade Autolune	rene Operations	System - Preser Out Action Key Prese Simulation Key Prese Simulation Key Prese Simulation Autotume PD Hay Prese Simulation Gd PID > PD Set Channel 1	*	0 to 9998 (6) Tune Off. (1) Onl PID Set 1. (2) Onl PID Set 2. (3) Onl PID Set 3. (4) Onl PID Set 4. (5) Onl PID Set 5	
400350	349	CLEAR ERROR 1 REG	Cascade Autolute Clear Evor 3	Operations name	Hay Press Sinutation	*	ente any value	
400501	500	170 PROFEMAD_1_REG	Propertional Bank 1A - PIO Set 1	Opesations			(0 to 30000) degrees or units in integer, fertile. Foundation, or thousand/be+02	
400902	501	STI MIEDINAL 1,960	Hegral 1A - PIO Set 1	Operations	568 PD > PD Set Owned 1 > PD Set 01 568 PD > PD Set Owned 1 > PD Set 01 > PD Set 01 1> PD Set 01 1> PD Set 01 568 PD > PD Set Owned 1 > PD Set 01	r'm	(0 to 999% minutes in hundreithe	
400503	502	NZ RESET_UREG	Reset N PID Set 1	Operations	Edit PID = PID Sel Channel 1 = PID Set 01	r'e	(0 to \$989) per minute in hundredtha	
400504	101		Develor-1A - PID Set 1	Operations	Eat PID-PID Set Channel 1-PID Set 01	170	El la 1999) visuales in handreellik	
40000	504	374 MATE_1_REG	Rate 1A - PID Set 1	Operations	Sitt PID > PID Set Channel 1			
-0.000					THE PROPERTY OF THE PARTY IN	-	(0 to 900% minutes in hundrellitre	
400505 400507	505 506	97 CYCLE, TIME, 1, REG	Dead Band 1A - PID Set 1 Cycle Time Value - Output 1A.	Operations Setup	= PID Set 01 Control Output 1A Sidt PID > PID Set Channel 1	t'w	(D to 20000) degrees or units in integer, tentite, humbrida, or thousandths (1 to 600) seconds in tenths	
40000	607	SN HISTERESS, 1, REG	Hydresia SA - PID Set 1	Operations			(1 to 30000) degrees or units in integer, bridge, hundredne, or thousandthe	
400(10)	101	se aurar_wook_i_neo	Cycle Time Type - Output 1A	Setup :	Control Output 1A Side PIO > PIO Set Cherriel 1	I/m	(I) Venetile Bust. (T) Fixed Time	
400511	510	384 PROPEAND_2_REG	Propostonal Band 1A - PIO Set 2	Operations	= PID Set 02	a'm	(0 to 30000) degrees or units in integer, tentria, hundreths, or thousand the	
400512	\$11	36 N/GGRU_3,RGG	Integral SA - PID Set 2	Operations	> PIO Set 02	196	(in 1990), without in hundrating (in 1990), with remaining from makes in hundrating (in 1990), with remaining from the hundrating (in 1990), without in hundrating (in 1990), which has hundrating (in 1990), which hundrating (in 1990), which has hundrating	
400513	812	386 RESET_Z_REG	Plenet SA - PID Set 2	Opensions	EM PID > PID Set Chaver 1 > PID Set 02	r'm	23 in 1999), per minute in handredlins	
400514	513			Operations	5dt PID > PID Set Orannel 1 - PID Set 03	r'w	IC to 5000 minutes in hundredfile	
400515	514			Operations	Gdt PID = PID Set Channel 1	1	IO to 8000 non-tea in handwithe	
40010	\$16			Operators	Edit PID > PID Set Channel 1	-		
					Edit PID > PID Set Orannel 1	6,44	pure account response or acres of relating to Selling, Turnel within, an Incommentation	
40016	SILT		Hydramain 1A - PID Set 3	Operations				
400521	520	396 PROPEAND_3_REG	Propertional Sent 1A - PIO Set 3	Operations				
400522	101	380 MTERORUL, 3,960	Integral SA - PID Set 3	Opensions				
400523	522	400 RESET_3_REG	Reset 1A - PIO Set 3	Operations	> PID Set 03	s'm	(0 to 9000) per execute in hundredities	
400524	523		Deciwitive IA - PID Set 3		Side PID + PID Set Cherriel 1 • PID Set 03	viv.	(0 to \$990) minutes in hundreiths	
400525	504			Operations		14	O to 8000 visitore in hundredité	
400526	525	ATT OF ADMAND 3 MED	Dead Band St., PRO Sel 3	Countries	Sit PD > FD Set Ownel 1	-	C in 1990) decrease or units in interest health in minutes or throughout the	
400520		407 DEPENDENT J. J. TEO	WANTED IN THOMAS	Operations	= PID Set 03 Edit PID = PID Set Charmel 1	**	(c) to 20000 objection or units in integer, benths, hundred to, at thousand the (1) to 200000 objection or units in integer, benths, hundred to, at thousand the (c) to 200000 objection or units in integer, sentus, number to, at thousand the	
	527	#SH HYSTERESIS_3_REG	Hydraelia 1A - PID Set 3	Operations	TO DO DO DO DO DO	178	IT IS JUNEAU DEGREES OF SITES IT ITTEGET. SHIPTIS. TILINDRICES. SF TROUBERETS	
400521	530	412 PROPEAND_4,REG	Occupant Contable Day	diam'r.	SOLUTION OF CHANGE I	T.	An annual control of the control of	



The script itself is straightforward,

Using one of the serial decoders (B&B electronics or one of the Pluggable ones)

pip3 install minimalmodbus

```
import minimalmodous

# Set up the instrument
instrument minimalmodous.Instrument('CONIB', 1) # find the com device in device manager, 1: the slave address
instrument.serial.basdrate = 9600
instrument.serial.tasspats = 8
instrument.serial.tasspats = 8
instrument.serial.tasspats = 8
instrument.serial.tasspats = 8
instrument.serial.tasspats = 9
instrument.s
```

minimalmodbus.Instrumentcid=0x26988f14490, address=1, mode=rtu, close_port_after_each_call=False, precalculate_read_size=True, clear_buffers_before_each_transaction=True, handle_local_echo=False, debuge=False, serial=Serialid=0x2698f14460, open=True(port='COM10', baudrate=9600, bytesize=8, parity='N', stopbits=1, timeout=0.2, xonxoff=False, rtscts=False, dsrdtr=False)>

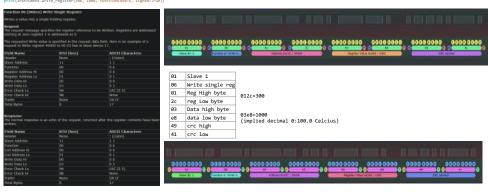
These chambers seem to not like a parity bit because of the 8 data bit format, but you could add it and play around using this line

an EVEN parity bit asserted (meaning 1), would mean that the data should have an even number of bits, so if the data returns an odd number the parity bit would not be asserted and would result in some sort of checksum error. I struggle with parity but thankfully its not needed

Set Temp

Set point register is 300

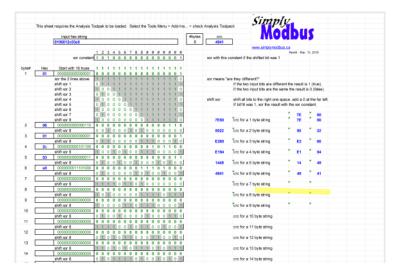
print(instrument.write_register(300, 1000, functioncode=6, signed=True)



01	slave id
06	write single reg
01	address high
2c	address low
03	data high
e8	data low
49	crc high
41	crc low

K cool, it works yo

The last thing I want to do is caluclate the crc. it should be straight forward



Python example, but keep in mind in outputs LOW BYTE first so switch the two $\,$

```
| The content of the
```

0111 1111 1111 1111 shifted right, fill in 16th bit with a zero

	shift xor 8 0 1 0 0 1 0 0 0 1 0 0 0 1 1 0	orc for a 10 byte string	
- 11	000000000000000000000000000000000000000		
	shift.xor8 1 1 1 1 0 0 1 0 1 1 0 0 1 0 1	orc for a 11 byte string	
12	000000000000000000000000000000000000000		
	shift xor 8 0 1 0 1 0 1 1 0 0 0 1 1 0 0 1 0	orc for a 12 byte string	
13	000000000000000000000000000000000000000		
	shift xor 8 1 1 0 1 0 1 0 1 1 1 0 1 0 1 1 1	orc for a 13 byte string	
14	000000000000000000000000000000000000000		
	shift xor 8 0 1 0 1 1 1 1 0 1 0 0 1 0 1 0 1	orc for a 14 byte string	
15	000000000000000000000000000000000000000		
	shift xor 8 0 1 1 0 1 1 1 1 1 0 0 1 1 1 1 0	orc for a 15 byte string	
16	000000000000000000000000000000000000000		
	shift xor 8 1 0 1 0 1 0 0 0 1 1 1 0 1 1 1 0	orc for a 16 byte string	

o this is basically a way to "mask" the results to only get the lsb
o you can ge the lsb but "anding" the crc with a 1
> LSR - logical shift right the crc (which is still 1111 1111 1111)

[1111 1111 1111 111 111 | LSR
0 | 0111 1111 1111 | shifted right, fill in 16th bit with a zero

> if lsb (meaning lsb = 1)

O XOR new CRC with the polynomial
o the polynomial is hex Medi; decimal 40,961
I tried researching this to see why it was this number but from what i've found its just
JFM

SO ALL OF THAT FIRST JUST THE FIRST BIT OF A 6 BYTE PACKET!!! It would take million years to do the whole thing by hand

so with some print-foo