

Subject: *SONARtrac*™ Troubleshooting Guide

TB008 Rev: 01

Priority: 5

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Purpose:

The purpose of this document is to formally release the $SONARtrac^{TM}$ Troubleshooting Guide.

The guide lists problems that may be encountered by personnel installing *SONARtrac*TM meters as well as actions to take to correct the problems. In the case where all troubleshooting techniques have been utilized, but the unit is still not working properly, please call CIDRA Technical Support at 203-626-3405 or after working hours call Pager # 203-766-4086.

The guide will be incorporated into the next manual release.

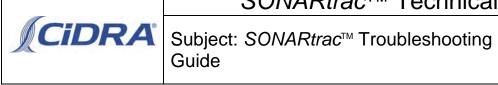
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Priority Code:					
1	Safety issue or system will not function	2	Intermittent problem causing system crash		
3	Erratic data/readings	4	Added product feature		
5	Product enhancement				

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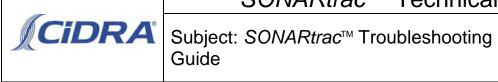


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	System Faults:							
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS			
			Check input power with volt	Yes - there is power and power is within system specs of 100 - 240 volt AC and 16 – 36 volt DC	See Below			
	System does not come on		meter	No - power to system or power is below spec	Check external wiring / circuit breakers, etc. to ensure power and that power is within spec Connect to alternate power source			
1	or was working and stopped working	No power to system	Check status of fuse(s)	Fuse(s) bad	Replace fuse(s) and see if blown fuse fault recurs. If problem recurs contact CiDRA Technical. Support.			
				Fuse(s) good	See below			
			Is the green LED lit	Yes	There is power to system but still does not come on Contact CiDRA Technical Support.			
				No	There is no power to the LED Contact CiDRA Technical Support.			
			Verify if there is power to	No	Troubleshoot per item 1			
			system	Yes	See below			
	Screen is		Is the ambient temperature below or above the operating range of the	Yes	Screen is located in an area outside of the temperature specifications. Relocate transmitter.			
2	blank	Screen is not working	screen (-20°C to +85)?	No	See below			
			Are system signal outputs (4-20 mA, etc) in operation	Yes – continue to use system with DCS output	Possible damaged or faulty screen. Contact CiDRA Technical Support.			
			and functional	No	Contact CiDRA Technical Support.			

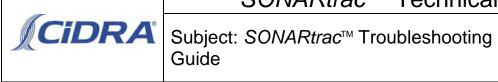


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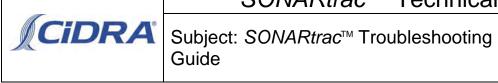
	System Faults:							
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS			
3	The display has random lines or makes no sense	BOOT and / or MAIN software is corrupt	Display shows lines or random characters		Contact CiDRA Technical Support.			
			Verify power source for	Power fluctuates	Connect to stable power source			
4	System keeps turning on and off	Low or dirty power to system	transmitter is stable and within operating range of system	Power is good and stable at between 100 – 240 volt AC or 18 – 36 volt DC	See below			
		•		Wire(s) not properly installed	Reconnect power cable			
				Wires installed properly	Problem may be internal to transmitter. Contact CiDRA Technical Support.			
			Varify navyar agurag for	Power fluctuates	Connect to stable power source			
_	The system keeps re-	tem Foor power source tr	Verify power source for transmitter is stable and acceptable	Power is good and stable at between 100 – 240 volt AC or 18 – 36 volt DC	See below			
5	booting on its own		'DPRAM TEST' in 'SELF	Fail either or both RAM and DPRAM test	Faulty RAM/DPRAM. Contact CiDRA Technical Support.			
			Pass both RAM and DPRAM tests	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.				



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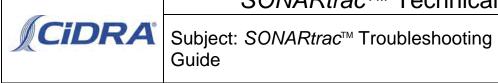
	System Faults:								
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS				
6	Screen is	Incorrect screen	Check screen setting in 'DISPLAY / CONTRAST in	No – the contrast setting is not 170	Adjust contrast setting up or down as necessary. If problem persists contact CiDRA Technical Support.				
6	light or dark in color	contrast setting	CUSTOMIZE menu. Normal setting is 170	Yes – contrast is set to 170	Try adjusting contrast. If this does not work contact CiDRA Technical Support.				
			Verify 4-20mA is wired to proper connector terminals	No – system is not connected to appropriate terminals	Reconnect wires; refer to section 8 of Transmitter Installation Manual				
		plant em	in the transmitter (internal or external power)	yes	See below				
			Verify 'POWER SEL' on '4 - 20mA CH1' (or 2) in OUTPUT CONFIG menu (internal or external) is set to correspond with the wiring option above	No – incorrect 'Power Sel' option.	Correct output option				
7	The 4–20mA input on plant data system does not			Yes	See below				
	work	Broken lead between transmitter and plant data system or faulty 4-20mA supply	Verify 4-20mA output on transmitter and at data	Yes, output from transmitter and input to plant system	Wiring is good				
			system Select '4-20mA TEST' under the DIAGNOSTIC	No signal at plant data system	Suspect wiring problem				
			menu to output discrete 4 through 20 mA signals.	No signal from transmitter	Suspect faulty 4-20mA output. Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.				



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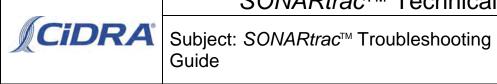
	System Faults:								
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS				
		Wrong Range	Verify the range setting are	Yes - Ranges of transmitter and DCS are the same	See below if problem persists				
		settings at transmitter or DCS	the same	No – range setting are different	Re-range the DCS or the transmitter				
	The 4–20mA display in control room does not match the flow rate on the meter	ay in ol room	Scroll to '4mA TRIM' in the 4-20 mA CH 1(2) submenu under the OUTPUT CONFIG menu in order to access trim function. Press ENTER and follow instructions	Yes – the output is correct	See below				
				No – the output needs to be adjusted	Input values per transmitter screen values. If problem persists see below				
8		th the rate on	Disconnect input signal lines from PLC card. Connect current meter to leads. Output discrete mA signals using '4-20mA TEST' under the DIAGNOSTIC menu.	Yes – the current meter readings match the transmitter output values	A 4-20mA signal isolator may be required. Contact CiDRA Technical Support.				
				No – the current readings do not match the transmitter values	See below				
		The 4-20mA values generated by the transmitter in '4-20mA Test' do not match the signals seen at the end of the signal cable	Connect current meter at the 4-20mA terminals in the transmitter and output discrete signals using '4- 20mA Test'	Yes - The signals output from the transmitter match the current meter readings	Plant wiring may have a problem. Verify integrity of signal wires.				
				No – the output from the meter dos not match the current meter readings	Contact CiDRA Technical Support.				



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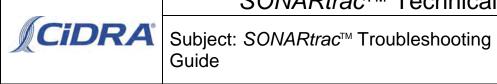
	System Faults:							
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS			
		Transmitter left in Idle Mode	Is Heart Beat Indicator Turning in Lower Right Corner	Yes – Heart Beat Indicator is Turning	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.			
9	The Display is Frozen (reads			No- Heart Beat Indicator is not turning	Cycle power to transmitter			
9	same value all the time)	Transmitter is hung (Cycle power to transmitter. Does the display update?	Yes – Display updates	Meter is properly functioning			
				No – Display is still frozen	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.			
10	The Display Reads Preamp Failure and there is no flow reading	Possible faulty Preamp or bad connection Possible faulty Preamp or bad connected Verify wiring and connectors are properly connected		No – wiring / connector fault found	Correct fault			
10				Yes – all wiring and connectors is correct	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.			



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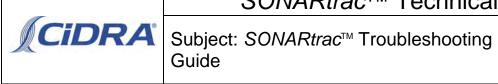
	System Faults:								
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS				
			Under Basic Menu, Verify Op Mode is set to FLOW for Flow Meter or GVF/SOS for Entrained Air	No – Op Mode is not set to VF for Flow Meter or GVF for Entrained Air Meter	Reset to proper operating mode				
11	The display reads "Invalid Mode"	Improper Op Mode selected or Display Settings selected	Meter or FLOW/GVF/SOS for combined meter operation	Yes – proper operating mode is selected	See below				
			Under Customize Menu verify Display Line 1 set to Flow Rate for Flow Meter or GVF for Entrained Air Meter, etc	No – Display Line 1 is not set to Flow Rate for Flow Meter or GVF for Entrained Air Meter,.	Change Display line 1 to appropriate mode				
				Yes – display is set correctly	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.				
12	The signal output from the SONARtrac TM meter is noisy	Need to use Damping or Noise Reduction Filter	See Filter Section of manual for more information on filtering	Yes – with filtering enabled, the signal is less noisy	Employ filtering at the transmitter or at the DCS				
12				No – with filtering enabled, the signal is still noisy	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.				



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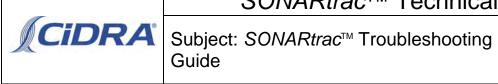
	Flow Meter Faults							
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS			
13	The signal output from the meter has	Nood to use Spike Filter	See Filter section of Manual	Yes – With filtering Enabled, signal is less noisy	Use this as new transmitter configuration			
13	spikes when the Flow starts or stops	Nood to use Snike Filter	in order to turn on filtering	No – With filtering enabled, signal is still noisy	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.			
	Flow does not	Improper pipe size	Verify pipe size input in	Yes – correct size entered	See below			
		entered	transmitter 'PIPE SIZE' in BASIC CONFIG menu	No – incorrect pipe size entered	Re-enter correct pipe size			
		Improper calibration coefficients entered in BASIC CONFIG menu match sensor band coefficients (on label in transmitter or on sensor	Verify coefficients in transmitter 'CALIBRATION'	Yes – correct values entered	See below			
14			No – incorrect values entered	Re-enter correct coefficients				
14	seem correct			Yes – all sensors are on	See below			
		All sensors are not turned on in 'SENSOR SETUP / ENABLE' in CUSTOMIZE menu	No – some or all are turned 'Off'	Turn on all sensors in Customize menu unless some were purposely turned off. If problem persists, Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.				



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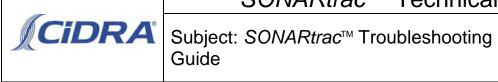
	Flow Meter Faults							
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS			
				Yes – passes all tests	See below			
		Sensor to transmitter wiring may be faulty	Run 'SENSOR CHECK' in DIAGNOSTICS menu	No – fails one or more tests	Verify and correct fault indicated on screen. If problem persists, Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.			
	Flow does not seem correct	One or more sensors may be faulty	Run 'SENSOR MAX/MIN' in INFO menu	Yes – all sensors are within 30% of each other (process must be flowing at nominal flow rate)	See below			
14				No – one or more sensors vary from the others by >30%	Potential sensor failure. Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.			
		Incorrect viscosity or density settings	Verify correct settings in BASIC CONFIG menu	Yes – the proper settings are input	See below			
				No - the settings are not correct	Correct inputs in BASIC CONFIG menu			
			le the existence (Lieuwin est)	Yes	System is operational and communicating with DSP.			
			(indicated by a spinning '\l/-') on bottom right of screen	No	The system is designed to reset automatically after 30 minutes. If reset does not occur, cycle power to system. If this recurs, contact CiDRA Technical Support.			



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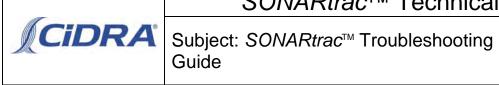
	Flow Meter Faults							
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS			
				Pass	This indicates all sensors are good and functional.			
14	Flow does not seem correct	A cable connection between the sensor and transmitter is cut or disconnected	Run 'SENSOR CHECK' under DIAGNOSTIC menu	Fail	 Verify wire connections in transmitter are all good. Verify cable is not cut or damaged. Verify cable connector on sensor head is connected. Remove sensor head access panel per Installation Manual and ensure sensor to preamplifier connector is properly connected. If system does not function, acquire Snapshot, upload to secure Website, and contact CiDRA Technical Support. 			
		is below set point ow rate yed is a	The default value of VQ (if displayed on the transmitter front panel) is 0.2.	Value is equal to or greater than 0.2 consistently	Indicates system is above minimum threshold for making a reading			
45	The flow rate displayed is a series of dashes ()			Value is less than 0.2	Indicates system is below minimum threshold to make a reading. Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.			
15		Sensors are saturating	Go to 'EVENT LOG' in INFO menu and press ENTER	Yes - A message of 'Sensor Over' will be present if a sensor has been saturated	Go to 'GAIN' on DIAGNOSTICS menu. Press ENTER and scroll to AUTOSET GAIN and press ENTER GAIN will be adjusted to proper level			
				No message for 'Sensor Over'	See below			



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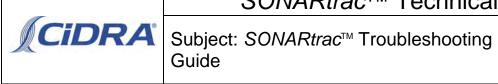
	Flow Meter Faults								
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS				
	The flow rate	Undefined	Take s 'SNAPSHOT' using StBasic or SONARstick	Post on secure Web site in Technical Support area	Contact CiDRA Technical Support.				
15	displayed is a series of	Process operating flow	Is the process flow rate < 3	Yes	System normal specification is a low flow cutoff of 3 ft/sec				
	dashes ()	is less than the system programmed minimum flow setting	ft/sec	No	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.				
	The flow rate displayed is '> max flow'	Lie greater than the Lie the pro-		Yes	System normal specification is a maximum flow cutoff of 30 ft/sec				
16			Is the process flow rate > 30 ft/sec	No	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.				
			Select and run 'AUTOSET GAIN' found in GAIN submenu of DIAGNOSTICS menu	Yes -The reading is less erratic.	Use this as new transmitter configuration				
		Sensors are saturating		No – The reading is still erratic	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.				
17	The Flow Reading is erratic	Reading is	Yes – the value is set to zero	The operation may be outside the measurement capability of the meter. Contact CiDRA Technical Support.					
			No – the value is not set to zero	Lower the low end cutoff.					



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	Flow Meter Faults				
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS
	The Flow Reading is erratic	The meter is mounted too close to an elbow or obstruction	If possible move meter to a straight run of process pipe.	Yes – The reading is less erratic	
18				No – The reading is still erratic.	Acquire Snapshot, Upload to secure Website, and contact CiDRA Technical Support.



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	GVF Meter Faults:					
Item No	PROBLEM	POSSIBLE CAUSE	DIAGNOSTIC METHOD	DIAGNOSTIC RESULT	COMMENTS	
19	The GVF Meter Displays dashes ""	The acoustics at the measurement location are too low	Contact CiDRA Technical Support.			
20	The GVF Reading is erratic	Signals may be saturated	Select and run 'AUTOSET GAIN' found in GAIN submenu of DIAGNOSTICS menu	Yes – this corrected the problem	Take Snapshot and send to CiDRA Technical Support.	
				No – the problem persists	Take Snapshot and send to CiDRA Technical Support.	
21	The GVF Meter always reads 50% GVF or some other value that is not correct	Transmitter setup parameters are incorrect	Verify setup parameters to ensure they are correct	Yes – the setup parameters are correct	The actual GVF of the fluid is >50% or what is indicated on the transmitter	
				Yes – the setup parameters are correct but the GVF is definitely incorrect	Take Snapshot and send to CiDRA Technical Support.	
				No – the setup parameters are not correct	Correct transmitter input parameters in BASIC CONFIG menu	



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	n			
11/20/06	01	R. Markoja	E06-0104	Initial Release

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