

T4020/T5020 Tank Gauge Configuration A Step by Step Guide.

PD02/0004 - Revision: 01 - March 2017

The set-Up of T4020/T5020 Tank Gauge system using Interface lead and he software on a PC / Laptop. Latest version of the software is **V1.0.0.16** Tank Gauge adjustments can be made with the T4020 Configuration software. This needs to be loaded on to Service Laptops or an Office PC.

1st Issue that will nearly always catch you out. Are the gauges set in "Modbus" mode, or if they are in "Standard" mode. To talk to the gauge with the configurator software, the gauge needs to be in "Standard" mode. If it is not in "standard" mode, disconnect the power lead (24vdc supply), and hold down the front alarm test button (**PRESS/HOLD TEST BUTTON**) for 3 seconds and then reconnect the power, hold for another second. (Front display will change to from "Modbus" to 'Standard), if not, just remove power and reapply power. (Cycle power again when finished.)

2nd Issue, the comms lead will not talk to the tank gauge. "USB Serial Com Port" not set to correct COM port address. See below on how to set up or document **PD02/0003**.

This is the port you require to set the configurator, this is achieved by following the instructions for **the Device Manager** below.

IF YOU HAVE ANY ISSUES WITH SETTING UP / ACCESSING THE DEVICE MANAGER PLEASE REFER TO DOCUMENT **PD02/0003 – DEVICE MANAGER CONFIGURATION.**

Windows Setup (Windows 10) / Device Manager.

Left click on the *This PC* icon. Scroll down and click on the *Properties* tab.

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		Properties				Computer name:	DESI
						Full computer name:	DES

This will open the Control Panel / System and Security / System page. Click on the **Device Manager** Icon. This will bring up the device manager page.

Scroll down and there will be a folder **Ports (COM & LPT)**. It should show the USB Serial Port with the Com port it is attached to, in this case, (**COM7**), this will vary on whatever computer the programmer is attached. This is the figure that is entered in the T4020 Configuration Software. The communications lead RED LED should flash when you try to connect the USB programmer to show the address for the lead is correct.

🗄 Device Manager	
<u>File</u> <u>Action</u> <u>View</u> <u>H</u> elp	
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Connect the Programmer to the T4020 / T5020 Unit as shown in Page 7.

T4020 Configurator (Configuration) Software.

Next step is to open the T4020 Configuration Software.





This will open the *Settings* screen (Shown Below). Select from the dropdown menu the Com Port number (as shown in the device manager) and click OK.



Next step, click the *Device* tab at the top of the screen and click *Connect*. A pop up screen, *Input Value* will show, click on *OK*.

Node ID 99 is a global address which will work if only have one gauge connected.

Input Value	Information
Please enter the RS-485 Node ID of the device you wish to connect to. (Note: ID 99 will connect to all devices) 99	You have selected ID 99. This is a broadcast address Please ensure only one device is connected to the RS-485 bus before you continue. Do you wish to continue?
OK Cancel	(<u>Y</u> es

Click on Yes on the Information screen.

Now the software will connect and "talk" to the unit, as shown in the bottom left of the configuration screen. When the unit has connected, it will show **CONNNECTED** in the bottom right of the Configuration Screen.







Click on the *Display Options* tab.

T4020 Configurator File Device Help Device Device Device Device	Sensor Parameters 凸 Tank Settings 🛱 Alarm Setpoints	
Display Options: Display options allow you change settings for the LCD display "For units without a display these options will not be enabled" Please note: when changing the contrast you must click on the Write Settings' button before the contrast settings are saved perminantly. Screen damping is a time period in seconds for each display update. For large tanks it is recommended this value is set high. <u>Read Settings</u> <u>Write Settings</u>	Current Contrast Value: 47% Uisplay Resolution 10.000 Display Units of Measure Litres Screen Damping 2.00 (Secs)	
		CONNECTED

Current Contrast Value, default is 47%. Set as required.

Number of Significant figures is 5. On the T5020, there is the option to choose *Resolution of Display*, e.g. 50 Litres or 10 Litres etc. Set as required. *10.00* for instance.

Display Units of Measure, set to Litres unless otherwise requested.

Screen Damping, makes the screen more stable, suggest 2 Seconds.

When this screen is complete, Click *Write Settings*.

Click on the Sensor Parameters tab. Note: Set to Suit the Sensor, NOT TE TANK.

📲 T4020 Configurator					
File Device Help					
🚺 Device Status 🔍 Display Options 🧶 Sensor Parameters 💁 Tank Settings 🔀 Alarm Setpoints					
Sensor Parameters: Sensor Low Values (Leve	el A)				
The sensor parameter options on this page allow you to scale the input range of your sensor to the T4020	(m.)				
device. Using this scaling you can allow for dead-leg as well as specific gravity.	(mA)				
Enter in the sensor readings for 2 fluid height levels; a sensor low (level A)	el B)				
and a sensor high (level B). Once you have calculated the two fluid levels you may enter a specific	(m.)				
gravity constant if you are using a pressure sensor, otherwise leave this value at 1.	(mA)				
Specific Gravity 0.840					
Read Settings					
	CONNECTED				

Sensor Min, set to **50mm** (0.05m) as standard. Sensor (Min) Reading set to *4.00mA* This would mean for example a 2m Sensor, would be set as a Sensor Min 0.05m to a Sensor Max 2.05m. and a 3m Sensor would be Sensor Min 0.05m and Sensor Max 3.05m etc. Sensor Max, set to Sensor 0.05m plus the Sensor length as shown in example above. Sensor (Max) Reading set to 20.00mA Enter the **Specific Gravity** of contents. Enter the value of what is required from the list below. Gasoil = 0.84 / Diesel (Derv) = 0.835 / Kerosene = 0.80 / Petrol = 0.745 / AdBlue = 1.09 Rapeseed Oil = 0.92 / Lube Oil = 0.89 and Antifreeze = 1.11

When this screen is complete, Click Write Settings.

Click on the *Tank Settings* tab.

File Device Help							
	14020 Configurator						
	File Device Help						
 Device Status Display Options Sensor Parameters Tank Settings Alarm Setpoints Tank Setup: Tank Setup allows you to specify the tank type you wish to linearies. There are 4 built in tank types: a horizontal cylinder with 2 endcaps, a cuboid, a vertical cylinder. Select the non standard tank type if you wish to manually enter you rank parameters. Select type 'none'if there is no tank information required. The tank name will be displayed on the second screen for units with a display. Read Settings Write Settings Write Settings Alarm Seting	(m.) (m.) (m.)						
	CONNECTED						

The next step is to set the tank shape up. Enter the tank type from the scroll down menu, a name for the tank and the measurements.

Note that the tank can be taller than the sensor range due to specific gravity.

For example, the tank as being 2.2m tall. If we say this is Diesel (DERV), then $2.2 \times 0.835 = 1.837$ affective range on the sensor. This means we can use a 2.0m sensor in a 2.2m tank.

(A 3m sensor will work fine as well).

Ensure that the Enable 4-20mA Output is ticked.

Please make sure the Mirror Output box is NOT 'Checked' (ticked). If it is we need to discuss. The Mirror input may be used when a second Gauge is set exactly the same as the first. Alternatively, the second Gauge can be set to have the Sensor Parameters the height of the primary tank and this will work over the full 4-20 milliamp range of the first gauge output. No sensor offset required.

When this screen is complete, Click Write Settings



Click on the *Alarm Setpoints* tab. 🥄

🞢 T4020 Configurator					
Device Status Q Display Options Alarm Setpoints & Test Alarm settings allows you to assign up to 4 alarms. Alarms relate to the 4 output drivers on the device. You can create raising edge alarms - alarms that are triggered when the level goes above the setpoint, or failing edge alarms - alarms that are triggered when the level goes below the setpoint. Push the test button to test the output on the device for 5 seconds.	Sensor Parameters Master Alarm Direction Setpoint Hysterisis Alarm 2 Direction Setpoint	Tank Settings	Alarm Setpoints Alarm 1 Direction Setpoint Hysterisis Alarm 3 Direction Setpoint	Enabled E	TEST (%) (ms) TEST (%)
Read Settings	Hysterisis	(ms)	Hysterisis		(ms)
				C	ONNECTED



Set the Alarm settings as required (High is normally 95% Rising).

Set the "Direction" to "Rising" or "Falling". This will result in energising the Relays (R5 Option Board) if fitted in that 'form'.

Rising at 95% on the M alarm will output 24vdc when the level increases to 95%.

When this screen is complete, Click *Write Settings*.

Next step is to Access the T5020 additional settings and Summary Screen, press the *Ctrl*, and letter *H* keys simultaneously, and click on *Device Status* Tab.



This will bring up the summary screen of what has been programmed into the unit as shown below

T4020 Configurator						
file Device Help						
🚯 Device Status 🔍 Display Options 👄 Sensor Parameters 凸 Tank Settings 👸 Alarm Setpoints 🖆 Summary						
Unit Serial Number	Software Version: 1.12					
Display Options						
Current Contrast Value: 47%	Display Resolution: 10.000	Display Units: Litres				
Display Resolution Hysteresis 25	Screen Damping: 2.00					
Sensor Parameters						
4.000mA Level: 0.050 Meters Water	20.000mA Level: 3.050 Meters Water	Specific Gravity: 0.840				
Tank Settings						
Tank Type: Cuboid	Tank Name:					
Tank Length: 2.000	Tank Height: 2.000	Tank Width: 2.000				
Enable 4-20mA Output: YES	Mirror 4-20mA Input: NO	Safe Working Capacity 100 %				
4mA - 20mA = 0 to 8000 Litres						
Alarms						
Master - Direction: Rising Edge	Master - Setpoint: 93.000%	Master - Hysteresis: 2000ms				
Alarm 1 - Direction: DISABLED	Alarm 1 - Setpoint: DISABLED	Alarm 1 - Hysteresis: DISABLED				
Alarm 2 - Direction: DISABLED	Alarm 2 - Setpoint: DISABLED	Alarm 2 - Hysteresis: DISABLED				
Alarm 3 - Direction: DISABLED	Alarm 3 - Setpoint: DISABLED	Alarm 3 - Hysteresis: DISABLED				
General						
Mount Sensor 0 mm off bottom of tank	Bund Alarm Fitted?	Comms Type Standard				
Node Address: 99	Completed Date					
Name:	File saved as					
Read Settings Write 9	Settings					
		CONNECTED				

The Summary page. Click on the **Device** tab at the top of the screen and click **Read All settings**. This will display all the settings that has been programmed. Next stage is to enter the final information on this screen.



Unit Serial Number: This is the serial number on the label of the front of the unit.

Safe Working Capacity: If the unit is a T5020, the Safe Working Capacity can be set to say 97%. In this case the Alarms are based on the Safe Working Capacity value, so 10,000 litre tank has SWC of 9,700 litres. An Alarm set at 95% will be 95% of 9,700 litres, not of 10,000.

Mount Sensor: 50 mm off the bottom of the tank.

Bund Alarm: If fitted, click YES, if not, Click NO.

Comms Type: Generally, set to **Standard**.

Name, Who, setup the unit, *Date* when setup and a *File Saved as* Name. XXXXXXXX.tls

Click the *File* tab at the top of the screen and then "*Save As*". When this screen is complete, click the *Device* tab at the top of the screen again and then *Write All Settings*.

ONLY READ AND WRITE SETTING FROM THE DEVICE TAB AT THE TOP OF THE PAGE.

If you have selected 'Non-Standard' as the tank type and put in a strapping table, you may have to "Write All Settings" Twice. Click on *Disconnect*. Remove the programming lead. This completes the calibration. Result, you should have a fully calibrated working Gauge, with 4-20 mA proportional to Litres, and either a *Standard* or *Modbus* RS485 output.