How to use TM Trend Analysis?

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How to add a new measurement to a component?

- 1. Click [Inventory] \rightarrow [Components]
- 2. Double click the component you want to add a measurement to.
- 3. Click the 'Trend analysis' tab.



There are two types of measurements:

~~	Trend	(step 4-5)
1	Consumption	(step 6-7)

4. To add a Trend measurement, click the Trend icon 2 found to the top left menu.

2 TmMv2 - Measure	ement : Vibration Measuring Point 1 ME1 on 601.01 ME 1 (Main Engine 🛛 🗌	×
File New R R R R	ave and Close 🛛 🐣 🛛 🔀 🛛 💂	
General Rules Read	lings Baselines Chart	
Name:	Vibration Measuring Point 1 ME1	
Category:	Vibration points v External Tag: CD1234	
Description:		
Uom:	m per sec 🗸 Sort order: 0	
Min value:	0.50 Max value: 6,00	

- 5. Enter the trend measurement values.
 - 5.1. Enter a Name, so that all users know what this measurement is measuring.
 - 5.2. Enter a **Description** of the measurement, so that all users involved will understand what it is supposed to measure.
 - 5.3. Select a Unit of Measurement (UOM)

- 5.4. The **Sort order** value lets you create an alternative sort order of your measurements if required.
- 5.5. Enter a **Minimum value**. (The minimum value is the lowest value for the X axis in the chart.)
- 5.6. Enter a Max value. (The maximum value is the highest value for the X axis in the chart.)
- 5.7. Enter an 'Alarm min. value'. This is entered by going to the 'Rules' tab please see the 'How to add a rule to a measurement' section below. The Alarm min. is the lowest 'acceptable' value for this measurement. If a value lower is entered as a reading, the system will ask the user if a corrective action should be created. The area in the graph view between 'Min value' and 'Alarm min value' is colored red. (As shown below)
- 5.8. Enter an 'Alarm max. value'. This is entered by going to the 'Rules' tab please see the 'How to add a rule to a measurement' section below. The Alarm max. is the highest 'acceptable' value for this measurement. If a value higher is entered as a reading, the system will ask the user if a corrective action should be created. The area in the graph view between 'Max value' and 'Alarm max value' is colored red. (As shown below)



Please note that the graph will be scaled based upon the highest and lowest readings entered, in some cases you will not be able see the Alarm max and minimum value borders in the graph.

6. To add a Consumption measurement, click on the consumption icon found to the left on the toolbar.

• 🗄 🖬 🔜	Save and Close	🚔 🔀 🖸 ose 💂
General Readings	Chart	
Name:	My Consumption N	Mesurement
Description:		
Uom:	Metric toni	Sort order: U
-NOX/CO2 Calcu	lation	
NOX factor:	54,700	NOX and CO2 calculation are based on metric tonnes.
Carbon content:	0.780	It measurement UOM differs from metric tonnes, a conversion factor must be given in the "MT Conversion" field.
ourser content.	0,700	This value is normally less than 1.
	0.01501	

- 7. Enter the consumption measurement settings.
 - 7.1. Enter a **Name** describing the consumption measurement.
 - 7.2. Enter a **Description** of the measurement, so that all users involved will understand what it is supposed to measure.
 - 7.3. Select an appropriate Unit of Measurement. (UOM)
 - 7.4. If the consumption produces NOX/CO² you can enter the NOX factor, carbon content, and MT conversion. This can be used to calculate your NOX/CO² emissions later on.

Note: Trend & Consumption measurements can also be created directly from the Trend module. The user is presented with the component structure immediately after clicking the add trend \bowtie or the add consumption \bowtie button

TMMv2 - Select parent component	_		×
Tree			
Search			
👜 🔁 101 Documentation, Publications & Log Books			^
🗈 🛅 109 Instruction Material, Maintenance System			
112 Class.statutory, Cert.			
121 QA/Work Routines/Procedures			
⊞ 🛅 192 Gas, oxygen, oil			
196 Consumables/Stores/Oil/Gas, etc.			
196.01 Chemicals			
196.02.01 Internine 9/9 Ocean Blue			
196.04 Working elethon			
196.05 Ball bearings			
196.06 Welding Consumables			
261 Hull & House Markings			
262 Bottom Plug/Sea Chest/Bilge Well/Water Jet Intake			
278 External cathodic protection			
284 Cargo Tanks, Intergrated & Loose			
📩 陆 DOG DURUK OLER TURE OLERUGUE OLER FURIER			~
Unit: M/V Patriot Games 2 Select root Clear Selection 9	<u>0</u> K	<u>C</u> ance	

How to Add a Baseline to a Measurement

- 1. Click [Inventory] → [Trend Analysis]
- 2. Double click the measurement you want to add a baseline to
- 3. Select the 'Baselines' tab
- 4. Click [New Baseline]

🖞 New Baseline fo	or Diesel Oil Fuel Meter ME1	-	×
File			
New 📙 📑 📑	Save and Close 🛛 🗧 🛛 🖉 Glose		
General			
achad			
Name:	Normal consumption baseline		
Line Type:	Solid V Color: Aqua V		
Show Type:	Show constantly V Trend type: Consumption Trend V		
Value:	23,00		
Ref. Value:	12.00		
Description:	It's a baseline for normal use of the engine		

- 5. Add a Name
- 6. Select a Line Type
- 7. Select a Color
- 8. Select a Show Type
- 9. Add a Value (this is the value of the baseline)
- 10. Add a Ref value, if desired (this is for filtering purposes)
- 11. Add a Description, if desired
- 12. Select a Trend Type (For Consumption measurements only)
- 13. Click [Save and Close]

How to Add a Rule to a Measurement

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Imiviv2 - Measure	ment : Main Exhaust I	emp MES on 601.	JS IVIE 3 (IVIAIN Eng	ine Stod inboard)	-		^
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ew 📕 📑 🔜 Sa	ave and Close 🛛 📑	🔀 Glose 💂					
General Rules Read	nas Passians Chat						
General Holes Head	ings Baselines Char		• • · · · · · · · · · · · · · · · · · ·			87	
New Rule 🛅 🗶	Columns	Group Y	<u>Refresh</u>				
Name	Rule Type	Severity	Value Descrip	tion			
Alarm Max	Alarm Max	😑 Low	390				
Alarm Min	Alam Min	😑 Low	275				
Allowed Daily Change	Max increase value p	. 🔵 Medium	25				
<							>

- 1. Click [Inventory] \rightarrow [Components]
- 2. Double click the component you want to add the rule to.
- 3. Click the 'Trend analysis' tab.

- 4. Double click the measurement you wish to add a rule to
- 5. Click the 'Rules' tab
- 6. Click [New Rule]



- 7. Enter the Rule values measurement settings.
 - 7.1 Enter a Name describing the Rule
 - 7.2 Select the Rule type.



7.3 Select the Severity



- 7.4 Enter a **Value** for the rule type
- 7.5 Enter any additional **Description**, if required
- 7.6 Click [Save and Close]

Note: Measurements that currently have a reading that has broken a rule are shown on the Ship \rightarrow Overview



Corrective actions for trend readings break rules

When a value is registered that breaks a rule (for example, it is either above the 'Alarm max value' or below the 'Alarm min value'), the user is presented with a message similar to the following

🖉 TmM	/2 - Trend ana	lysis				-		×
<u> </u>	larm Max : A	larm Max						
The rea	ding 395 Degr.	C is above th	ne alan	n level (3	90 Deg	r. C)		
Are you	sure the readin	a is correct?						
Karal		g io concor.		al de la				
If it is, pl	ease create a c	corrective acti	ion for	the reading	ng			
	🗸 Create a	a corrective a	iction f	or the me	asurem	ent rea	ding	
		Yes	1 [Cance	1			

If the user chooses to continue and leaves the corrective action creation ticked. A ONE job will be automatically created for the reading with today's date as the due date. The value of the reading and the rule value that has been breached are inserted as part of the description for the job, but users may enter extra text as they see fit.

neral items Personnel Ot	nercosts Risk analysis Do	cuments (D)	Job history Ch	ange log Work per	nits				
lame: Corrective action	for measurement Cooling W	/ater Temp in I	ME1						.0
td. Job:						(3) (8)		9.0	10 m
Yority:	~	Class job	ц		-				
repartment:	×	Joh Tao				✓ Date Interval	interval	0	14
io orgin:		Created By:	damen			Next due:	07.05	2018	
Meganic I.	×	Man hours:				Har	internal		
ateopry 2:	~					Interval:		0 H	Y
						Net due		0	
Local description: The reading 96Degr. C is abo	re the alarm level (94Degr. C)							^ D

Readings that have resulted in corrective actions are indicated both in the grid list of readings and in the graphs as shown below

Preview	Preview
Readings Chart	Readings Chart
🛅 🗙 🔍 🕒 Columns 📑 Group 🍸	The start of the s
Reading value UOM Reading date	Reading value UOM Reading date 👻 Change
96 Degr. C 07.05.2018 11:	84,3 Degr. C 10.05.2016 00:00 James B
85,6 Degr. C 15.06.2016 15:	82,1 Degr. C 04.05.2016 00:00 James E
95 Degr. C 08.06.2016 00:	94,5 Degr. C 04.05.2016 00:00 System
84.4 Degr. C 30.05.2016 00: Reading resulted in a corrective action is 2010 00:	Reading resulted in a corrective action that has been done es E
84.3 Degr. C 10.05.2016.00	85 Degr. C 14.04.2016 00:00 James E



Note: It is also possible to add a ONE job or a Job History to any reading at any time using the relevant buttons on the toolbar



How to Add a reading to a measurement

🙎 New Measurem	ent reading for Vibration Measuring Point 1 ME1 — 🛛	\times
Ele		
New 📑 📑 🔜	Save and Close 🛛 📇 🎾 Show job 🛞 Show job history 🛛 🔀 Gose 💂	
General		
Last reading:	2,90 m per sec sq	
New reading:	0,00 m per sec sq	
Reading date:	07.05.2018 13:09 🗸	
Changed by:	darren Date: 07.05.2018 13:09	
Comment:		

- 1. Click [Inventory] \rightarrow [Component]
- 2. Double click the component you want to add the reading to.
- 3. Click the 'Trend analysis' tab.

- 4. Double click the measurement you wish to add a reading to
- 5. Select the 'Readings' tab
- 6. Click the Add New Reading 34.5 button
- 7. Fill in the New reading
- 8. Set the **reading date** and time
- 9. Write a **comment** if desired
- 10. Click [Save and Close]

Note: Consumption measurement readings have the possibility to enter the 'Consumption since last'. Figures entered into this field, will automatically fill out the new reading field as 'Last reading' + 'Consumption since last'.

How to enter readings directly in the grid

It's possible to enter readings for measurements directly into the trend analysis overview grid. Readings entered here will automatically be registered with the current date and time.

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Consumption Component Name A Last reading value	Description	Uom	_ ^
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Hazardous materials Height ware designed for the vibration readings 601.02 ME 2 (Main En Cooling Water Temp Out ME2 96.5			
Vice and Readings 601.03 ME 3 (Main En Cooling Water Temp Out ME3 90			
601.04 ME 4 (Main En Cooling Water Temp Out ME4 94.1			
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			>
Last service loop: 00:00:00 darrening, looped on to DR - DW-PC011TEROMARIN	NE\663 trend upgrade tes	t from 659	h .:

- 1. Click [Inventory] → [Trend Analysis]
- 2. Click the Edit Grid 🗹 button
- 3. The Last reading column will now be highlighted, enter the values accordingly

How to Create Measurement Groups

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	M Trend analysis - M/	/ Patriot Games 2
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Ship ¥	Tree	
Inventory \$		
		🔜 Columns 🛅 Group 🏹 🔊 <u>R</u> efresh 👫 🛨
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	Test the Voyage Measuren	ent: 601.03 ME 3 (Main En Cooling V
Hazardous materials	·····	601.04 ME 4 (Main En Cooling V
Alarm system		601.02 ME 2 (Main En Cooling V
		601.03 ME 3 (Main En Cooling V
Certificates		601.04 ME 4 (Main En Cooling V
		648.01 HOT WATER Diesel Oil
Stock		601.01 ME 1 (Main En Diesel Oil
		601.02 ME 2 (Main En Diesel Oil
2 4 9 Running hours		601.03 ME 3 (Main En Diesel Oil
Trand analysis		
		Preview
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- 1. Click [Inventory] \rightarrow [Trend Analysis]
- 2. Click the Add Root Node button

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General									
Name:	Consumptions								
Group Category									
Group category	End of sea passage readings	\sim							
Measurements									
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- 3. Type a **Name** for the group
- 4. Select a Group Category (if appropriate)
- 5. Click [Save and Close]

Measurements can then be added to the groups by dragging them from the upper right pane and dropping them on the group in the structure pane.

Note: Measurements can be linked to several groups at the same time. When viewing the contents of a specific group, two additional buttons are available on the toolbar for connecting and disconnecting measurements



How to Show a Component's Running Hours in the Trend Module

2 TM Master v2 (v.2.663 - 31.08.2020)	-	
Ele Iools Help		
4) Units 🔹 M/V Patriot Games 2 🔹 🔚 🖪		
🖉 🌠 Trend analysis - M/V Patriot Games 2		
Fleet Trend analysis Trend comparison		
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	ective Action rective Action	Done.
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05.05.2015 06.08.2015 07.11.2015 08.02.2016 11.05.2016 Date		
Concerning logged on to DB - DW-PC01\TEROMARINE\663 trend up	grade test from	659 🔥

- 1. Click [Inventory] \rightarrow [Component]
- 2. Double click the component you want to add to the Trend Running Hours group.
- 3. Select the "Running Hours" tab.
- 4. Tick the 'Show Running Hours in the Trend module' check box



5. Click [Save and Close]

How to Apply Trend Groups to Voyage Event Type

- 1. Click [Administration] \rightarrow [Codes]
- 2. Select the 'Voyage Event' code table from the drop down.
- 3. Double click the voyage event code that you wish to link to trend groups.
- 4. Select the 'Trend Group Category'

End Of Sea Passage		-	×
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Seneral			
Name:	End Of Sea Passage		
Code:	EOSP		
Event Type	PortAndSailing 🗸		
Trend group category:	~		
	All Fast Measurements		
	End of sea passage readings		
	Departing port		
	Show in Lists		
Sort order:	0		
	Validated		
	- Fondacoa		

- 5. Click [Save and Close]
- 6. Click [Inventory] \rightarrow [Trend analysis]
- 7. Find the trend group that you wish to use for the voyage event code
- 8. Right click and select [Open]
- 9. Select the same group category as you did for the voyage event code

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10. Click [Save and Close]

Note: Through the use of the trend group categories it is possible to link several trend groups to one particular voyage event code.

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Hazardous materials	🖂 🖦 🕆 🖕	- 🚡 345
상 Alarm system	Search	Consumption Component Name A Last reading va A
	All Items	
	Ungrouped items Voyage Event Trends	Garbage discharged
Stock	🖿 Running Hours	Garbage on board
	Consumptions	HPO loaded HFO Stock
21419 Running hours	Test the Voyage Measurements	LNG Consumption
Trend analysis	Vibration Readings	LSFO loaded
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		🌔 Last service loop: 00:00:00 darrenimp, logged on to DB - DW-PC01\TEROMARINE\663 trend upgrade test from 659 🗞 ,

How to Show Voyage Event Fields as Trends

- 1. Click [System] \rightarrow [Settings]
- 2. On the 'General' Tab, select the 'Voyage Event Trends' sub tab

System Settings toomets The shed settings Mandatory Fields Mr.
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- 3. Tick the Voyage Event Fields that you wish to see in the trend module
- 4. Click [Save]

Note: This is a global setting for all units in the fleet

How to Register Readings from a voyage event

- 1. Click [Voyage] \rightarrow [Current Voyage Log]
- 2. Double click or create an event that requires readings
- 3. If there are readings required, the Enter Readings button will be active



4. Click the [Enter Readings] button

🖉 Ent	er readings											-	· 🗆	×
	Component	Measurement	UOM	Last reading date	Last reading v	Chosen Reading	Reading date	Chosen readin	New Value	Min value	Max value	Time Diff. to Event (r	ninutes)	
	ME 1 (Main Engine Port Out	Cooling Water Temp Out M	Degr. C	29.11.2018 10:27:00	40690	Existent Reading	21.08.2020 09:51:00							0
	ME 3 (Main Engine Stbd In	Main Exhaust Temp ME3	Degr. C	29.11.2018 10:27:00	0	Existent Reading	21.08.2020 09:51:00	362		250	400			0
	ME 3 (Main Engine Stbd In	Vibration Measuring Point 2	m per se	21.08.2020 09:51:00	0,18	Existent Reading	21.08.2020 09:51:00	0,18		0,5	6			0
	ME 4 (Main Engine Stbd Ou	Main Exhaust Temp ME4	Degr. C	21.08.2020 09:51:00	365	Existent Reading	21.08.2020 09:51:00	230		250	400			0
												<u>O</u> K	(Jancel

- 5. Enter New readings in the New Value column
 - Or

Click the selector button in the Reading Date column to choose from existing readings

- 6. Tick the Check Boxes to select which readings to register
- 7. Click [OK]

Note: Any events that require readings that have not had all the required readings registered will be highlighted in a red colour in the voyage event grid

Master v2 (v.2	663 - 31.08	2020)					×
							-
<u>File T</u> ools <u>H</u> elp							
₩ New • All Units		 M/V Patriot Ga 	ames 2 🔹 🛃				
		where we are a second s			Handana Bast		
		voyage no. v	/OY-PATG2-0003-1	a Currently in port: Ro	otterdam Port		
Rect	* 1	Voyage log Cargo Dela	ays Letters of protest Doc	uments Change Log			
Ship	×	Tree		📙 🛅 🗙 🗂 Event	Report 🚉 📑 Columns 🛅 Group 🍸	🔊 Befresh 👭 🗉 🖻 🐐	1
1		WOY-PATG2-00	03-18				
inventory	*	Saling: Stavanger	Port Port to Rotterdam Port	🗈 🔒 🖇	Daily reporting		
Movable Assets	*	Port: Rotterdam	Port	Voyage event code	Voyage No	Event comment Date	
		Saling: Rotterda	am Port to Newcastle Port	I⇒ Voyage Commenced	VOY-PATG2-0003-18	12.02.7	2019
Maintenance	×	Port: Newcastle	Port	🕆 All Clear	VOY-PATG2-0003-18	12.02.2	2019
Comm		Saling: Newcas	tle Port to Alesund Port	🗘 Tm Daily Report	VOY-PATG2-0003-18	13.02.2	2019
Clew		Port: Alesund Po	ort	D Full Away on Passage	VOY-PATG2-0003-18	14.02.2	2019
Slop Chest & Accou	m ¥		Port	Course Change	VOY-PATG2-0003-18	15.02.2	2019
				🖧 Tm Daily Report	VOY-PATG2-0003-18	16.02.2	2019
Voyage	*			A End Of Sea Passage	VOY-PATG2-0003-18	18.02.2	2019
XXX V				🗘 All Fast	VOY-PATG2-0003-18	11.06.2	2020
Voyage				🗘 All Fast	VOY-PATG2-0003-18	11.06.2	2020
The Connect on the	alaa			🖞 All Fast	VOY-PATG2-0003-18	21.08.2	2020
EE Culter Voyage	enog	Voyage No	VOY-PATG2-0003-18				
Vovage templa	100	Voyage Name	New voyage for conditi				
Att to age tempte		Masters Name	Richard Harris				
Post History		Expected Start Date	01.jan.0001.00:00	-			
		Expected End Date	01.jan.0001.00:00				
Decking	× 1	Commenced Date	12 feb. 2019 12:53				
Docking	•	Completed Date		-			
Purchasing	×						
				<			>
HSEQ	*			General Documents (0) Cha	ange Log Linked Cargo		
Document Handling) *			Event Details			-1
darren's Place	*			Voyage event :	Voyage Commenced Voyage Commenced	officer on watch:	
				Event comment:	Engin	e officer on watch:	
Tools	*	<	>	• L			_1
					10.		1.0
				Last service loop: 00:00:00	darrenimp, logged on to DB - DW-PC01\TEROMA	RINE\663 trend upgrade test from 659	8.

How to Add a Trend Group to Component Job

		_	
DIS6 BHS Safety Valve, Dismantle/Clean/Overhaul on 284.20.01.01 SAFETY VALVE BULK TANK 1 PORT	-		X
e			
🛛 🔜 Save and Close 🛛 📇 🍓 🖌 Job done 🛞 Postpone 🔍 🗙 Qose			
General Items Personnel Other costs Risk analysis Documents Job history Change Log Work permits Measurements			
Measurement Groups			
👔 Link group 📳 🗙 🕄 🖏 Columns 🥅 Group 🍸 🧑 Refresh 👫 🕀 🖃 🐚 🔹 🏹			
Measurement Group Trend group category			
Some of the vibration readings			
Measurements			
n 🔁 🔀 🗓 Columns 🥅 Group 🍸 🔊 Refresh 🧥 🕀 🖃 🖷			
Consumption Component Name Description UOM Min value Max value Last read	ng date	Last rea	dine
601.01 ME 1 (Main En Vibration Measur m p 0,5 6 14.06.20	16 15:54		
601.04 ME 4 (Main En Vibration Measur m p 0,5 6 14.06.20	16 00:00		
¢			>

- 1. Click [Maintenance] \rightarrow [Due]
- 2. Double click the component job you want to add the Trend Group to.
- 3. Select the 'Measurements' tab.
- 4. Click the [Link Group] button



5. Select the group you want to link and click [OK]

Note: Once a measurement group is attached to a component job, users will be required to enter readings for the measurements as part of the sign out process.

How to Register Readings from a component job signing out process

- 1. Click [Maintenance] \rightarrow [Due]
- 2. Select a job that requires readings
- 3. Click [Job Done]
- 4. If there are readings required, the Enter Readings button will be active

ut job	34.5 Enter	r readings	X	<u>C</u> lose	
		Enter mea	surer	ment readings	i –
Previou	us job histor	Work pe	rmits	Risk/Conseque	ince

5. Click the [Enter Readings] button

V2 E	nter	readings									-		×
		Component	Measurement	UOM	Last reading date	Last reading v	Chosen Reading	Reading date	Chosen readin	New Value	Min value	Max v	alue
	1	ME 1 (Main Engine Port Out	Vibration Measuring Point 2	m per se	14.06.2016 15:55:07	2,6	Reading Unavailable				0,5		6
	1	ME 2 (Main Engine Port Inb	Vibration Measuring Point 2	m per se	19.08.2020 13:22:07	2,9	Reading Unavailable				0.5		6
	1	ME 2 (Main Engine Port Inb	Vibration Measuring Point 1	m per se	21.08.2020 00:00:00	5,5	Reading Unavailable				0,5		6
	1	ME 3 (Main Engine Stbd In	Vibration Measuring Point 2	m per se	21.08.2020 09:51:00	0,18	Reading Unavailable				0,5		6
	1	ME 3 (Main Engine Stbd In	Vibration Measuring Point 1	m per se	14.06.2016 15:56:09	2,7	Reading Unavailable				0,5		6
											<u>O</u> K	Can	cel

6. Enter New readings in the New Value column

Or

Click the selector button in the Reading Date column to choose from existing readings

- 7. Tick the Check Boxes to select which readings to register
- 8. Click [OK]

How to Calculate CO2 & NOX for consumption measurements

- 1. Click [Inventory] \rightarrow [Component]
- 2. Double click the component you want to calculate NOX / CO2 for
- 3. Click the 'Trend analysis' tab.
- 4. Double Click the relevant Consumption Measurement
- 5. Select the Chart tab

6. Click the 🖆 button 🧟 TmMv2 - Calculate consu... \times 07.05.2018 00:00:00 \sim From: 07.05.2018 00:00:00 \sim To: Cons.: 0,00 Cubic Metre NOX: 0,00 kg CO2: 0,00 tonnes NOX factor: 54,65 Carbon cont .: 0,78 Calculate 0.82 MT conv.:

- 7. Set the From & To dates accordingly
- 8. Click [Calculate]

The consumption in the chosen UOM, the NOX production in kilograms and the CO2 production in metric tons should now be shown for the chosen time period

Note: An additional function has been added to the voyage module where the user can select two events from the voyage log which will then calculate NOX/CO2 between the two chosen event times for all registered consumption measurements for the unit.

The NOX / CO2 calculation

To achieve the desired results from the NOX/CO2 calculation, a number of figures must be in place.

- 1. Registered Consumption readings both before and after the chosen time period
- 2. A NOX factor figure
- 3. A Carbon Content figure
- 4. An MT Conv figure

If the user only wishes to calculate consumption, then only number 1 of the above list is required.

NOX Factor: This a figure which is specific to a piece of equipment and is derived from test data for the equipment. It basically indicates how much NOX a piece of equipment will generate for a given amount of fuel.

Carbon Content: This figure represents the amount of carbon in the fuel that is used for a standard unit of measurement. For example, if the carbon content of the fuel is 56,3%, then the Figure entered in the Carbon Content filed should be 0,563

MT Conv figure: This figure is used to convert the reading figures to metric tons. Typically, flow meters attached to engines measure the volume of fuel used by the engine, so this needs to be converted to metric tons. The MT Conv figure should be used, taking into account both the density of the fuel and the unit of volume that is utilized (for cubic metre readings, the MT Conv figure should be the density. For any other unit of volume and additional volume conversion needs to be factored into the MT Conv figure)

The three figures presented to the user are calculated according to the following equations

Cons (chosen UOM) = Diff. between consumption readings at chosen times

NOX (kilograms) = Cons * MT Conv * NOX Factor

CO2 (metric tons) = Cons * MT Conv * 3.664 * Carbon Content

Consumption, NOX and CO2 charts

To enable the possibility to use baselines (see section 'How to Add baselines') in connection with consumption measurements, 3 extra charts have been added to the 'Chart tab'. These charts utilise the calculation methods described above, to show the readings from a different perspective.

The 'Default' chart is a straight representation of the consumption readings



The 'Consumption Trend' chart is based on a calculation of difference in quantity from each reading to the previous reading, divided by the time between the two readings to give an average per day figure.



The 'CO2 Trend' chart uses the CO2 calculation method (detailed in 'The NOX / CO2 calculation' section) based on the consumption calculated from the difference in quantity from each reading to the previous reading. This is divided by the time between the two readings to give an average per day figure.



The 'NOX Trend' chart uses the NOX calculation method (detailed in 'The NOX / CO2 calculation' section) based on the consumption calculated from the difference in quantity from each reading to the previous reading. This is divided by the time between the two readings to give an average per day figure.



How to set up the Import of Readings from an External System

- 1. Click [System] \rightarrow [Settings]
- 2. On the 'General' Tab, select the 'Trends Readings' sub tab



- 3. Select which system you want to import from
- 4. Set the 'File Path' to the readings file
- 5. Click [Save]
- 6. Restart Tm Master V2

How to Import Trend Readings from an External System

- 1. Click [Inventory] → [Trend Analysis]
- 2. Click the Import trend readings ¹⁴⁵ button

2 I	Tag	Reading value UOM	TM UOM	Reading date	Description	Measurement	Import status
100	KSP014	42030		29.11.2018 09:27:00	MDO LCV		Not recognised!
	KSP014	42030		29.11.2018 10:27:00	MDO LCV		Not recognised!
2 😐	KSP015	40590	Degr. C	29.11.2018 08:27:00	HFO LCV	Cooling Water Temp Out M	The reading 40690 Degr. C.
2 0	KSP015	40690	Degr. C	29.11.2018 09:27:00	HFO LCV	Cooling Water Temp Out M	The reading 40690 Degr. C.
-	KSP015	40690	Degr. C	29.11.2018 10:27:00	HFO LCV	Cooling Water Temp Out M	The reading 40690 Degr. C.
2 0	KSP016	41995	Degr. C	29.11.2018 08:27:00	MGO LCV	Cooling Water Temp Out M	The reading 41995 Degr. C.
2 0	KSP016	41995	Degr. C	29.11.2018 09:27:00	MGO LCV	Cooling Water Temp Out M	The reading 41995 Degr. C.
2 0	KSP016	41995	Degr. C	29.11.2018 10.27:00	MGO LCV	Cooling Water Temp Out M	The reading 41995 Degr. C.
2	KSP017	0 kg/nm		29.11.2018 08:27:00	SHIP OVERALL EFFICIEN	Shaft Torque	
2	KSP017	0 kg/nm		29.11.2018 09:27:00	SHIP OVERALL EFFICIEN	Shaft Torque	
-	KSP017	0 kg/nm		29.11.2018 10:27:00	SHIP OVERALL EFFICIEN	Shaft Torque	
2 0	KSP018	0 g/kWh	m per sec sq	29.11.2018 08.27.00	M/E SPECIFIC FUEL RAT_	Vibration Measuring Point 1	The reading 0 m per sec sq.
2 0	KSP018	0 g/kWh	m per sec sq	29.11.2018 09:27:00	M/E SPECIFIC FUEL RAT	Vibration Measuring Point 1	The reading 0 m per sec sq.
2 0	KSP018	0 g/kWh	m per sec sq	29.11.2018 10:27:00	M/E SPECIFIC FUEL RAT	Vibration Measuring Point 1	The reading 0 m per sec sq.
20	KSP019	0 m/kwhr	Degr. C	29.11.2018 08:27:00	PROPULSION EFFICIENCY	Main Exhaust Temp ME3	The reading 0 Degr. C is b
2 0	KSP019	0 m/kwhr	Degr. C	29.11.2018 09:27:00	PROPULSION EFFICIENCY	Main Exhaust Temp ME3	The reading 0 Degr. C is b
v 0	KSP019	0 m/kwhr	Degr. C	29.11.2018 10:27:00	PROPULSION EFFICIENCY	Main Exhaust Temp ME3	The reading 0 Degr. C is b
100	KSP024 047	17 1337457242232 m		29.11.2018 08.27.00	SHIP DRAFT FWD		Not recognised!

- 3. Tick the Readings you wish to import
- 4. Click [OK]

If any of the readings have broken rules, you will receive this warning

2 Import	×				
Some of the readings you are importing have broken rules for their measurements, are you sure you want to import them?					
OK Cancel					

5. Click [OK] if you wish to proceed without changes



How to Compare trends & consumptions

- 1. Click [Inventory] \rightarrow [Trend Analysis]
- 2. Select the 'Trend Comparison' tab
- 3. Click the Add Measurements 🌌 button

🕜 TmMv2 - 9	Select measurem	ients			-	$\Box \rightarrow$	<
🗎 🗙 🔍	🔥 Columns	Group	Pefresh		1		
	- 🕻 🌢						
Consumption	Component	*	Name	Description	Uom	Min value	^
	601.01 ME 1	(Main En	Vibration Measur		m p	0,5	
	601.01 ME 1	(Main En	Cooling Water T		Deg	20	
	601.01 ME 1	(Main En	Main Exhaust Te		Deg	250	
	601.01 ME 1	(Main En	Vibration Measur		m p	0,5	
	601.01 ME 1	(Main En	Diesel Oil Fuel M		Cubi		
	601.01 ME 1	(Main En	Cooling Water T		Deg	87	
	601.02 ME 2	(Main En	Vibration Measur		m p	0,5	
	601.02 ME 2	(Main En	Cooling Water T		Deg	20	
	601.02 ME 2	(Main En	Vibration Measur		m p	0,5	
	601.02 ME 2	(Main En	Cooling Water T		Deg	87	
	601.02 ME 2	(Main En	Diesel Oil Fuel M		Cubi		\sim
<						>	
				Clear Selection	OK	Canaal	
				Crear Selection	Qiv	Gancer	

- 4. Select the measurements you wish to compare
- 5. Click [OK]
- 6. Adjust the date range accordingly

Note: It is also possible to display the running hours for several components within the trend

comparison chart by clicking the Add Running Hours button. In combination with use of the voyage module, there is also the facility to view Voyage Event field trends in the comparison graph by

clicking the Voyage trend 🏙 button