

THE MEASURABLE DIFFERENCE.



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▼

OXYGEN TRAINING > COUNTER CHANNELS



COUNTER CHANNELS - HARDWARE OVERVIEW



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Content:

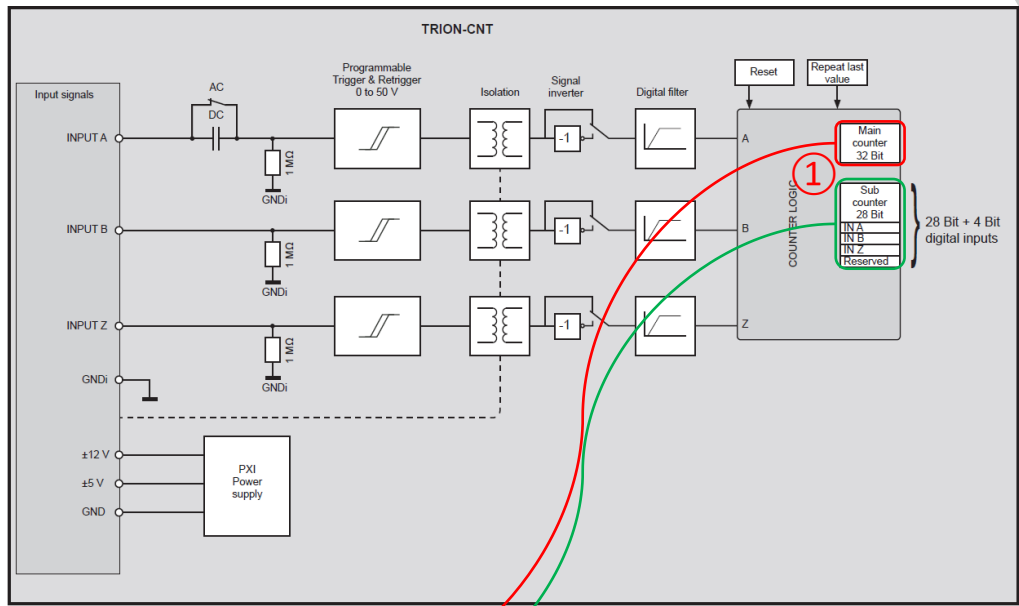
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- > Channel settings
- > Exemplary sensor setups
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 - > Rotational encoders
 - > Linear encoders
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 - > Frequency determination

Hardware								
	TRION-CNT	TRION-BASE	TRION-TIMING	TRION-VGPS	TRION-1802/1600-dLV	TRION(3)-18x0-MULTI	TRION-1620-ACC	TRION-2402-dACC
#Counter	6	2	1	1	2	2	1	2
#Inputs/Counter	3 DI	3 DI	3 DI	3 DI	3 DI	1 AI	1 AI	1 AI
Isolation	✓	✗	✗	✗	✗	✓	✓	✗
Sensor supply	5V and 12V	5V and 12V	5V and 12V	5V and 12V	5V and 12V	0...24 V	✗	✗
Encoder (A,B,Z) support	✓	✓	✓	✓	✓	✗	✗	✗
Frequency measurement	✓	✓	✓	✓	✓	✓	✓	✓
Event counting	✓	✓	✓	✓	✓	✓	✓	✓
Trigger level	0 to 50 V 12 mV steps	CMOS/TTL	CMOS/TTL	CMOS/TTL	CMOS/TTL	75 % of input range	70 % of input range	CMOS/TTL
Counter time base	80 MHz	80 MHz	80 MHz	80 MHz	100 MHz	100 MHz	80 MHz	80 MHz
Max. input frequency	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz	2 MHz	1 MHz	500 kHz



BLOCK DIAGRAM TRION-CNT

- ① Each counter logic on a TRION board consists of two independent counters:
 - > 32-bit main counter
 - > 28-bit sub counter
- ② Each counter channel in OXYGEN consists of 4 independent sub channels
- ③ CNT x/x is a hardware channel and linked to Main counter. This channel is in event counting mode and counts the number of rising edges
- ④ Frequency_CNT x/x is a hardware channel and linked to the sub counter. This channel is in frequency mode and determines the frequency (inverse period) between two rising edges
- ⑤ Angle_CNT x/x is a software channel and determines the angle [°]
- ⑥ Speed_CNT x/x is a software channel and determines the speed [rpm]



TRION-CNT-6-L1B

Channel	Mode	Value	AVG	Unit
③ CNT 6/1 Sim	TRION-CNT-6-L1B	7.475416e+6	7.475416e+6	Events
④ Frequency_CNT 6/1 Sim	TRION-CNT-6-L1B	1.000000e+6	1.000000e+6	Frequency
⑤ Angle_CNT 6/1 Sim	TRION-CNT-6-L1B	5.256152e+6	5.256152e+6	Rotation
⑥ Speed_CNT 6/1 Sim	TRION-CNT-6-L1B	1.171875e+5	1.171875e+5	Velocity

!!! Per default, the hardware channels are not stored to the data file but only the software channels!!!
The reason is the huge data amount of these channels as they are 32-bit channels and may limit the data storage rate.



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COUNTER – INTERNAL TIMEBASE AND SAMPLE RATES

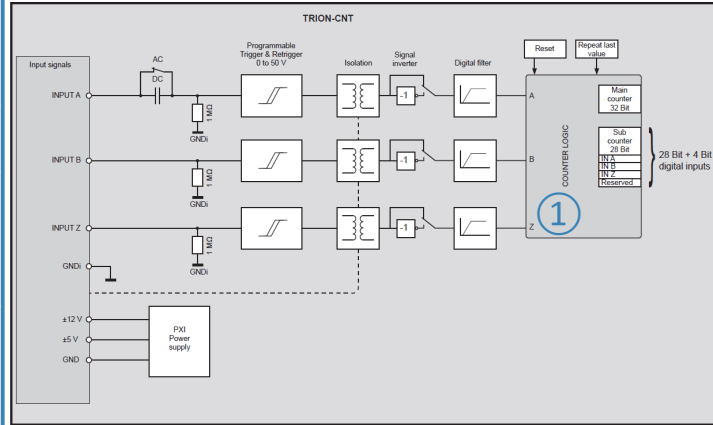
① Each counter logic has an internal timebase. For TRION-CNT and TRION-BASE boards it's 80 MHz.

It can't be edited by the user.

This is the timebase used to detect the edges of the signal applied to the input channel.

With a 80 MHz timebase, DEWETRON guarantees to detect max. 10 MHz signals.

More information can be found in the TRION series modules technical reference manual



TRION-CNT-6-L1B											
CNT 6/1 Sim											
CNT 6/1 Sim	TRION-CNT-6-L1B	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.475416e+6	AVG	Events	10000 Hz	-2.15e+09 .. 2.15e+09	Scale: 1 Offset: 0	Unit:
Frequency_CNT 6/1 Sim	TRION-CNT-6-L1B	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.000000e+6	AVG	Frequency	10000 Hz	0.001 Hz .. 80000000 Hz	Scale: 1 Offset: 0	Unit: Hz
Angle_CNT 6/1 Sim	TRION-CNT-6-L1B	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.256152e+6	AVG	Rotation	10000 Hz	0° .. 360°	Scale: 1 Offset: 0	Unit: °
Speed_CNT 6/1 Sim	TRION-CNT-6-L1B	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.171875e+5	AVG	Velocity	10000 Hz	-100000 rpm .. 100000 rpm	Scale: 1 Offset: 0	Unit: rpm

② The sample rate for the hardware channels (CNT_chn/x and Frequency_chn/x) specifies how often the data is transferred from the hardware to the software. Thus, it is possible to detect a 1 MHz signal if the hardware channel sample rate is just 10 kHz. The hardware sample rate is mainly important for accurate angle calculations. I.e. if a resolution of 0.1 ° is desired, the following minimum sample rate is required:

$$SR_{min} = \frac{360}{0.1} = 3600 \text{ Hz, i.e. select 5000 Hz}$$



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COUNTER – INTERNAL TIMEBASE AND SAMPLE RATES

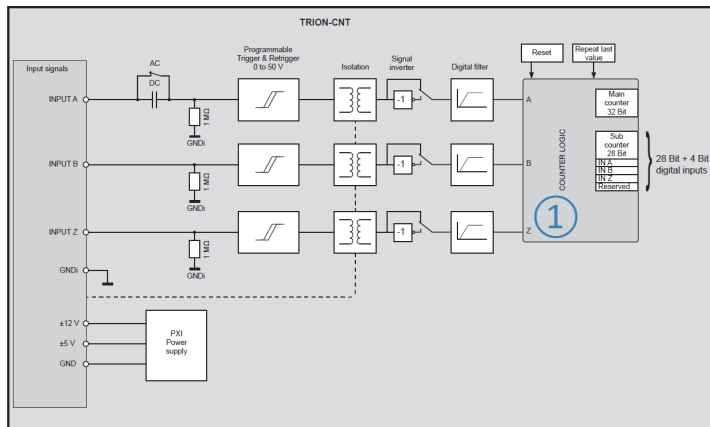
① Each counter logic has an internal timebase. For TRION-CNT and TRION-BASE boards it's 80 MHz.

It can't be edited by the user.

This is the timebase used to detect the edges of the signal applied to the input channel.

With a 80 MHz timebase, DEWETRON guarantees to detect max. 10 MHz signals.

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TRION-CNT-6-L1B										
6/1 Sim										
CNT 6/1 Sim	TRION-CNT-6-L1B			7.475416e+6	AVG	Events	10000 Hz	-2.15e+09 .. 2.15e+09	Scale: 1 Offset: 0	Unit:
Frequency_CNT 6/1 Sim	TRION-CNT-6-L1B			1.000000e+6	AVG	Frequency	10000 Hz	0.001 Hz .. 80000000 Hz	Scale: 1 Offset: 0	Unit: Hz
Angle_CNT 6/1 Sim	TRION-CNT-6-L1B			5.256152e+6	AVG	Rotation	10000 Hz	0 ° .. 360 °	Scale: 1 Offset: 0	Unit: °
Speed_CNT 6/1 Sim	TRION-CNT-6-L1B			1.171875e+5	AVG	Velocity	10000 Hz	-100000 rpm .. 100000 rpm	Scale: 1 Offset: 0	Unit: rpm

③ The sample rate for the software channels (*Angle_chx/x* and *Speed_chx/x*) can be set arbitrarily from the hardware channel sample rate and can be used to synchronize (resample) these channels to the analog sample rate of a different sensor signal (i.e. acceleration sensor) to provide time synchronous speed, angle and vibration data.



COUNTER – CHANNEL SETTINGS

- 1 The settings for all hardware and software channels (general counter group settings) can be entered by clicking on the *Gear* button of channel CNT x/x directly
- 2 The hardware/software channel-specific settings can be edited by clicking on the *Gear* button of the respective channel

The screenshot displays the DEWETRON software interface for configuring counter channels. The interface is organized into several panels:

- Channel List:** Located on the left, it shows a hierarchy of channels: [RemoteNode] > TRIONet > TRION-BASE > CNT 1/1. Individual channels like CNT 1/1@[RemoteNode], Frequency_CNT 1/1@[RemoteNode], Angle_CNT 1/1@[RemoteNode], and Speed_CNT 1/1@[RemoteNode] are listed with their respective gear icons.
- AMPLIFIER OPTIONS:** This panel is shown for the selected channel. It includes settings for Mode (Events), Threshold (2.4 V), Retrigger (0.8 V), and Filter (0.1 us).
- COUNTER GROUP SETTINGS:** This panel shows general settings for the counter group, including Type (Rotation), Pulses (512 pulses / revolution), and Resample rate (10000 Hz).
- EVENTS SETTINGS:** This panel shows SIGNAL ROUTING settings, such as Source_A (Input_A) and an Invert checkbox.
- SENSOR SCALING:** This panel shows Scaling (2-point Table), Unit (rpm), Scaling (1), and Offset (0).
- FREQUENCY SETTINGS:** This panel shows Mode (Frequency), Threshold (2.4 V), Retrigger (0.8 V), and Filter (0.1 us).
- VELOCITY SETTINGS:** This panel shows Mode (Velocity), Pulses (512 pulses / revolution), and Resample rate (10000 Hz).

Red arrows and circles highlight the gear icons in the channel list and the corresponding configuration panels, illustrating the steps described in the text.



EXEMPLARY CHANNEL SETUP FOR TACHO PROBES

- ① Go to the general counter group settings (Channel *CNT x/x*) and select *Events* Mode to count the number of pulses detected by the sensor
- ② Depending on the TRION board, it is possible to specify a user-defined *Threshold* and *Retrigger* level
- ③ The intent of the filter is to eliminate distortions like jitter or glitches from the signal and can be set to various gate times or set to *Off*. For more details, please refer to the TRION series modules technical reference manual.

AMPLIFIER OPTIONS

Mode ① Events

Threshold 2.4 V

Retrigger ② 0.8 V

Filter ③ 0.1 μ s

COUNTER GROUP SETTINGS

Type Rotation

Pulses 1 pulses / revolution

Resample rate 10000 Hz

SIGNAL ROUTING

Source_A Input_A Invert

HW reset SW reset





EXEMPLARY CHANNEL SETUP FOR TACHO PROBES

- ④ As tacho probes determine the rotation speed of a DUT, the *Rotation Type* must be selected
- ⑤ Enter the number of pulses per revolution delivered by the sensor (normally 1 for tacho probes)
- ⑥ Enter the resample rate (sample rate for software channels Angle_CNT x/x, Speed_CNT x/x)
- ⑦ Select the input of the counter channel (A, B or Z) to which the sensor signal is connected
- ⑧ Possibility to invert the signal
- ⑨ If *HW reset* is selected, an additional counter input can be selected to reset the event count and angle if a rising edge is detected
- ⑩ *SW reset* resets the Angle channel after 360° if selected
- ⑪ Immediately resets events and angle

AMPLIFIER OPTIONS

Mode Events

Threshold 2.4 V

Retrigger 0.8 V

Filter 0.1 μ s

COUNTER GROUP SETTINGS

Type Rotation

Pulses 1 pulses / revolution

Resample rate 10000 Hz

SIGNAL ROUTING

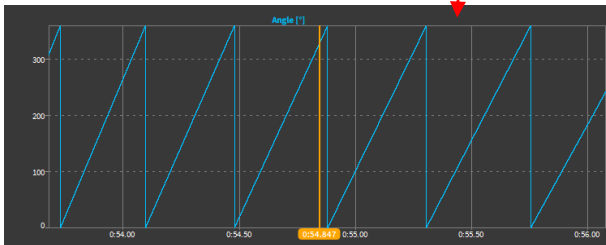
Source_A Input_A Invert

HW reset SW reset Reset now

HW reset SW reset Reset now

Source_Z Input_A Invert

Remark:
 With SW reset activated, OXYGEN calculates an angle from 0-360° though only one pulse per revolution is received





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EXEMPLARY CHANNEL SETUP FOR TACHO PROBES

Based on the applied settings,

- ① CNT x/x counts the number of detected events and increases by 1 every time a rising edge is detected
- ② Frequency_CNT x/x will determine the frequency between two rising edges
- ③ Angle_CNT x/x will output the actual angle and be reset after 360° if enabled (update rate depending on *Resample rate*)
- ④ Speed_CNT x/x will determine the running speed (update rate depending on *Resample rate*)

The screenshot shows a configuration tree for a remote node. Under 'TRIONet' and 'TRION-BASE', there is a 'CNT 1/1' section. Four items are listed with red circles and numbers 1 through 4:

- 1 CNT 1/1@[RemoteNode] (TRION-BASE, red icon)
- 2 Frequency_C...RemoteNode (TRION-BASE, green icon)
- 3 Angle_CNT 1/...[RemoteNode] (TRION-BASE, green icon)
- 4 Speed_CNT 1/...[RemoteNode] (TRION-BASE, purple icon)

AMPLIFIER OPTIONS

- Mode: Events
- Threshold: 2.4 V
- Retrigger: 0.8 V
- Filter: 0.1 μ s

COUNTER GROUP SETTINGS

- Type: Rotation
- Pulses: 1 pulses / revolution
- Resample rate: 10000 Hz

SIGNAL ROUTING

Source_A: Input_A Invert

HW reset SW reset

Remark:

It is not recommended to use tape sensors to determine the angle and speed of a rotating DUT as the discontinuity where both ends of the tape overlap cannot be detected and compensated. This will lead to a wrong angle and speed information





EXEMPLARY CHANNEL SETUP FOR ROTATIONAL ENCODERS

- 1 Go to the general counter group settings (CNT x/x) and select *Encoder Mode* to count the number of pulses detected by the sensor
- 2 Depending on the TRION board, it is possible to specify a user-defined *Threshold* and *Retrigger* level
- 3 The intent of the filter is to eliminate distortions like jitter or glitches from the signal and can be set to various gate times or set to *Off*. For more details, please refer to the TRION series modules technical reference manual.

AMPLIFIER OPTIONS

Mode	1	Encoder
Threshold	2	2.4 V
Retrigger	2	0.8 V
Filter	3	0.1 us

COUNTER GROUP SETTINGS

Type	Rotation
Pulses	500 pulses / revolution
Mode	X1
Resample rate	10000 Hz

SIGNAL ROUTING

Source_A	Input_A	Invert	<input type="checkbox"/>
Source_B	Input_B	Invert	<input type="checkbox"/>
<input checked="" type="checkbox"/> HW reset	<input type="checkbox"/> SW reset	Reset now	
Source_Z	Input_Z	Invert	<input type="checkbox"/>





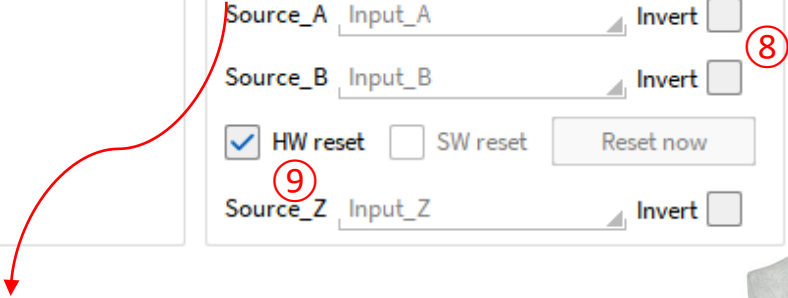
EXEMPLARY CHANNEL SETUP FOR ROTATIONAL ENCODERS

- ④ As rotational encoders determine the rotation speed of a DUT, the *Rotation* type must be selected
- ⑤ Enter the number of pulses per revolution delivered by the sensor (i.e. 360, 500, 512 or 1800)
- ⑥ Select the encoder counting mode with which the event count channel will increase or decrease the event count: *X1, X2, X4 or A-up/B-down*. For more details, please refer to the TRION series modules technical reference manual
- ⑦ Enter the resample rate (sample rate for software channels *Angle_CNT x/x*, *Speed_CNT x/x*)
- ⑧ Possibility to invert the signals
- ⑨ If *HW reset* is selected, the event count and angle will be reset if the signal connected to Z has a rising edge. No reset will be applied if *HW reset* is deselected

AMPLIFIER OPTIONS	
Mode	Encoder
Threshold	2.4 V
Retrigger	0.8 V
Filter	0.1 us

COUNTER GROUP SETTINGS	
Type	④ Rotation
Pulses	⑤ 500 pulses / revolution
Mode	X1 ⑥
Resample rate	⑦ 10000 Hz

SIGNAL ROUTING	
Source_A	Input_A Invert <input type="checkbox"/>
Source_B	Input_B Invert <input type="checkbox"/>
<input checked="" type="checkbox"/> HW reset <input type="checkbox"/> SW reset Reset now	
Source_Z	⑨ Input_Z Invert <input type="checkbox"/>



Remark:
The hardware signal routing cannot be changed for encoder channels





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EXEMPLARY CHANNEL SETUP FOR ROTATIONAL ENCODERS

Based on the applied settings,

- ① CNT x/x counts the number of detected events according to the selected counting mode
- ② Frequency_CNT x/x will determine the frequency between two rising edges
- ③ Angle_CNT x/x will output the actual angle and be reset after 360° if HW reset is enabled (update rate depending on Resample rate)
- ④ Speed_CNT x/x will determine the running speed (update rate depending on Resample rate)

AMPLIFIER OPTIONS	
Mode	Encoder
Threshold	2.4 V
Retrigger	0.8 V
Filter	0.1 us

COUNTER GROUP SETTINGS	
Type	Rotation
Pulses	500 pulses / revolution
Mode	X1
Resample rate	10000 Hz

SIGNAL ROUTING	
Source_A	Input_A Invert <input type="checkbox"/>
Source_B	Input_B Invert <input type="checkbox"/>
<input checked="" type="checkbox"/> HW reset <input type="checkbox"/> SW reset <input type="button" value="Reset now"/>	
Source_Z	Input_Z Invert <input type="checkbox"/>





EXEMPLARY CHANNEL SETUP FOR LINEAR (DISTANCE) ENCODERS

① Go to the general counter group settings (*CNT x/x*) and select *Encoder Mode* to count the number of pulses detected by the sensor

② Depending on the TRION board, it is possible to specify a user-defined *Threshold* and *Retrigger* level

③ The intent of the filter is to eliminate distortions like jitter or glitches from the signal and can be set to various gate times or set to *Off*. For more details, please refer to the TRION series modules technical reference manual.

AMPLIFIER OPTIONS		COUNTER GROUP SETTINGS	
Mode	① Encoder	Type	Linear
Threshold	② 2.4 V	Pulses	1000 pulses / m
Retrigger	0.8 V	Mode	X1
Filter	③ 0.1 us	Resample rate	10000 Hz

SIGNAL ROUTING	
Source_A	Input_A Invert <input type="checkbox"/>
Source_B	Input_B Invert <input type="checkbox"/>
<input checked="" type="checkbox"/> HW reset	<input type="checkbox"/> SW reset <input type="button" value="Reset now"/>
Source_Z	Input_Z Invert <input type="checkbox"/>





EXEMPLARY CHANNEL SETUP FOR LINEAR (DISTANCE) ENCODERS

- ④ Select *Linear* Type
- ⑤ Enter the number of pulses per meter delivered by the sensor (i.e. 360, 500, 512 or 1800)
- ⑥ Select the encoder counting mode with which the event count channel will increase or decrease the event count: *X1, X2, X4 or A-up/B-down*. For more details, please refer to the TRION series modules technical reference manual
- ⑦ Enter the resample rate (sample rate for software channels *Angle_CNT x/x, Speed_CNT x/x*)
- ⑧ Possibility to invert the signals
- ⑨ If *HW reset* is selected, the event count and angle will be reset if the signal connected to Z has a rising edge. No reset will be applied if *HW reset* is deselected

AMPLIFIER OPTIONS

Mode Encoder

Threshold 2.4 V

Retrigger 0.8 V

Filter 0.1 us

COUNTER GROUP SETTINGS

Type ④ Linear

Pulses ⑤ 1000 pulses / m

Mode X1 ⑥

Resample rate 10000 ⑦ Hz

SIGNAL ROUTING

Source_A Input_A Invert ⑧

Source_B Input_B Invert

HW reset SW reset Reset now

Source_Z Input_Z Invert ⑨

Remark:
The hardware Signal Routing cannot be changed for Encoder channels





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EXEMPLARY CHANNEL SETUP FOR (DISTANCE) ENCODERS

Based on the applied settings,

- 1 CNT x/x counts the number of detected events according to the selected counting mode
- 2 Frequency_CNT x/x will determine the frequency between two rising edges
- 3 Angle_CNT x/x will output the absolute distance from the Zero position (Input Z) if *HW reset* is enabled and the relative distance otherwise
- 4 Speed_CNT x/x will determine the velocity [m/s]

AMPLIFIER OPTIONS

Mode: Encoder

Threshold: 2.4 V

Retrigger: 0.8 V

Filter: 0.1 us

COUNTER GROUP SETTINGS

Type: Linear

Pulses: 1000 pulses / m

Mode: X1

Resample rate: 10000 Hz

SIGNAL ROUTING

Source_A: Input_A Invert

Source_B: Input_B Invert

HW reset SW reset

Source_Z: Input_Z Invert

Remark:
Other encoders (i.e. flow meters) can surely be connected to counter channels as well. The engineering unit can be changed in the Counter Group Settings





EXEMPLARY CHANNEL SETUP FOR FLOW METERS

- 1 Go to the general counter group settings (*CNT x/x*) and select *Events* mode to count the number of pulses detected by the sensor
- 2 Depending on the TRION board, it is possible to specify a user-defined *Threshold* and *Retrigger* level
- 3 The intent of the filter is to eliminate distortions like jitter or glitches from the signal and can be set to various gate times or set to *Off*.
For more details, please refer to the TRION series modules technical reference manual.

AMPLIFIER OPTIONS		COUNTER GROUP SETTINGS	
Mode	① Events	Type	Linear
Threshold	② 2.4 V	Pulses	250 pulses / l
Retrigger	0.8 V	Resample rate	10000 Hz
Filter	③ 0.1 us	SIGNAL ROUTING	
		Source_A	Input_A <input type="checkbox"/> Invert <input type="checkbox"/>
		<input type="checkbox"/> HW reset	<input type="checkbox"/> SW reset <input type="button" value="Reset now"/>





EXEMPLARY CHANNEL SETUP FOR FLOW METERS

- ④ As flow meters determine flow of a medium like water per time, the sensor outputs a linear signal. Thus, *Linear* Type must be selected
- ⑤ Enter the number of pulses per reference unit output by the sensor
- ⑥ Enter the resample rate (sample rate for software channels Angle_CNT x/x, Speed_CNT x/x)
- ⑦ Select the input of the counter channel (A, B or Z) to which the sensor signal is connected
- ⑧ Possibility to invert the signal
- ⑨ If *HW reset* is selected, an additional counter input can be selected to reset the event count and angle if a rising edge is detected
- ⑩ *SW reset* is not required for this sensor type
- ⑪ Immediately resets events and angle

AMPLIFIER OPTIONS

Mode Events

Threshold 2.4 V

Retrigger 0.8 V

Filter 0.1 us

COUNTER GROUP SETTINGS

Type Linear

Pulses 250 pulses / l

Resample rate 10000 Hz

SIGNAL ROUTING

Source_A Input_A Invert

HW reset SW reset Reset now

HW reset SW reset Reset now

Source_Z Input_A Invert





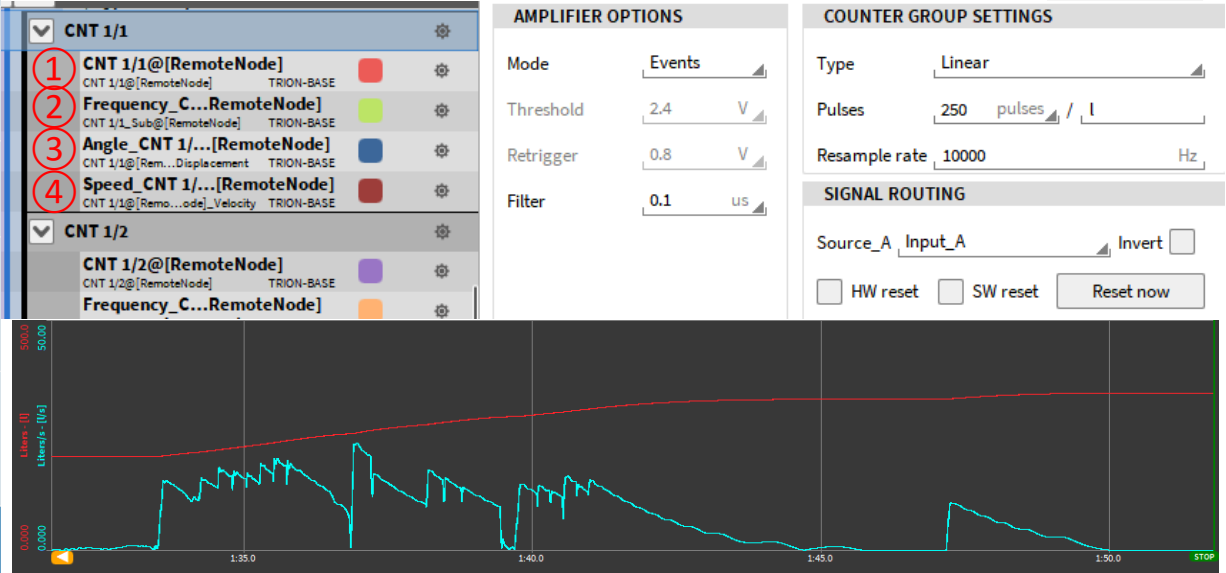
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EXEMPLARY CHANNEL SETUP FOR FLOW METERS

Based on the applied settings,

- ① CNT x/x counts the number of detected events and increases by 1 every time a rising edge is detected
- ② Frequency_CNT x/x will determine the frequency between two rising edges
- ③ Angle_CNT x/x will output overall flow measured by the sensor, i.e. the liters detected since acquisition start
- ④ Speed_CNT x/x will determine the throughput per time, i.e. the liters detected per second





EXEMPLARY CHANNEL SETUP FOR CDM+TRG SENSORS

- ① Go to the general counter group settings (*CNT x/x*) and select *Events* mode to count the number of pulses detected by the sensor
- ② Depending on the TRION board, it is possible to specify a user-defined *Threshold* and *Retrigger* level
- ③ The intent of the filter is to eliminate distortions like jitter or glitches from the signal and can be set to various gate times or set to *Off*. For more details, please refer to the TRION series modules technical reference manual.

AMPLIFIER OPTIONS

Mode **①**

Threshold **②** V

Retrigger **②** V

Filter **③** us

COUNTER GROUP SETTINGS

Type

Pulses pulses / revolution

Resample rate Hz

SIGNAL ROUTING

Source_A Invert

HW reset SW reset

Source_Z Invert





EXEMPLARY CHANNEL SETUP FOR CDM+TRG SENSORS

- ④ As CDM+TRG sensors determine the rotation speed of a DUT, *Rotation Type* must be selected
- ⑤ Enter the number of pulses per revolution delivered by the sensor (i.e. 360, 720 or 1800)
- ⑥ Enter the resample rate (sample rate for software channels *Angle_CNT x/x*, *Speed_CNT x/x*)
- ⑦ Select the input of the counter channel (A, B or Z) to which the sensor signal is connected
- ⑧ Possibility to invert the signal
- ⑨ Select *HW reset* and specify the counter channel to which the reference pulse (TRG) is connected
- ⑩ As *HW reset* is activated, *SW reset* is not applicable here
- ⑪ As *HW reset* is activated, *Reset now* is not applicable here

AMPLIFIER OPTIONS		COUNTER GROUP SETTINGS	
Mode	Events	Type	④ Rotation
Threshold	2.4 V	Pulses	⑤ 1800 pulses / revolution
Retrigger	0.8 V	Resample rate	⑥ 10000 Hz
Filter	0.1 us	SIGNAL ROUTING	
		Source_A	Input_A ⑦ Invert <input type="checkbox"/> ⑧
		<input checked="" type="checkbox"/> HW reset ⑩	SW reset <input type="checkbox"/> Reset now ⑪
		Source_Z	Input_Z ⑨ Invert <input type="checkbox"/>



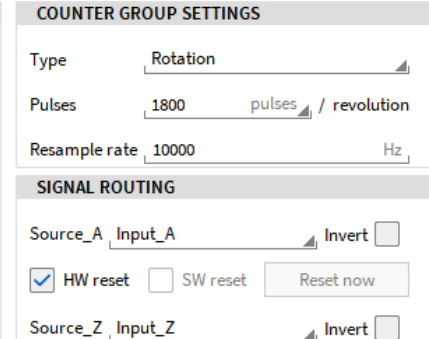
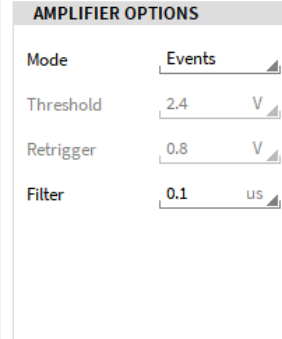
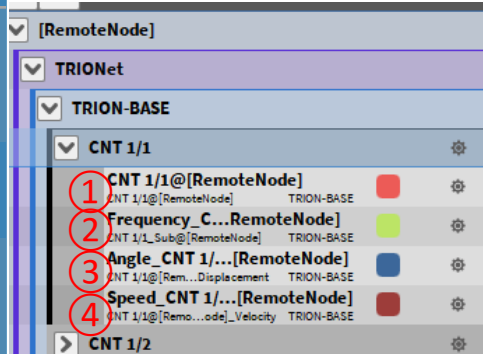


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EXEMPLARY CHANNEL SETUP FOR CDM+TRG SENSORS

Based on the applied settings,

- ① $CNT\ x/x$ counts the number of detected events according to the selected counting mode
- ② $Frequency_CNT\ x/x$ will determine the frequency between two rising edges
- ③ $Angle_CNT\ x/x$ will output the actual angle and reset after 360° as *HW reset* is enabled (update rate depending on *Resample rate*)
- ④ $Speed_CNT\ x/x$ will determine the running speed (update rate depending on *Resample rate*)





EXEMPLARY CHANNEL SETUP FOR FREQUENCY DETECTION (1)

There are 2 possibilities to detect the frequency of a signal connected to a CNT channel.
The first one is the following:

① Go to the general counter group settings (CNT x/x) and select *Events* or *Encoder* Mode to count the number of pulses detected by the sensor

② Depending on the TRION board, it is possible to specify a user-defined *Threshold* and *Retrigger* level

③ The intent of the filter is to eliminate distortions like jitter or glitches from the signal and can be set to various gate times or set to *Off*.
For more details, please refer to the TRION series modules technical reference manual.

④ Select the correct counter input to which the signal is connected (A, B or Z)

⑤ Frequency_CNT x/x will output the signal frequency in [Hz]

AMPLIFIER OPTIONS

Mode ①

Threshold ② V

Retrigger V

Filter ③ us

COUNTER GROUP SETTINGS

Type ←

Pulses pulses / revolution

Resample rate Hz

SIGNAL ROUTING

Source_A ④ Invert

HW reset SW reset

Remark:
Counter Group Settings can remain unchanged

Channel:

RemoteNode]

TRIONet

TRION-BASE

✓ CNT 1/1

- CNT 1/1@[RemoteNode] ⑤
- CNT 1/1@[RemoteNode] TRION-BASE
- Frequency_C...[RemoteNode]
- CNT 1/1_Sub@[RemoteNode] TRION-BASE
- Angle_CNT 1/...[RemoteNode]
- CNT 1/1@[Rem...Displacement TRION-BASE
- Speed_CNT 1/...[RemoteNode]
- CNT 1/1@[Remo...ode]_Velocity TRION-BASE

CNT 1/1_Sub@[RemoteNode] Frequency_CNT 1/1@[RemoteNode]

TRION-BASE

AMPLIFIER OPTIONS

Mode

FREQUENCY SETTINGS

SENSOR SCALING

Scaling 2-point Table

Sensitivity

Unit

Scaling ...z

Offset Hz





EXEMPLARY CHANNEL SETUP FOR FREQUENCY DETECTION (2)

- There are 2 possibilities to detect the frequency of a signal connected to a CNT channel. The second one is the following:
- ① Go to the general counter group settings (*CNT x/x*) and select *Frequency Mode*
- ② Depending on the TRION board, it is possible to specify a user-defined *Threshold* and *Retrigger* level
- ③ The intent of the filter is to eliminate distortions like jitter or glitches from the signal and can be set to various gate times or set to *Off*. For more details, please refer to the TRION series modules technical reference manual.
- ④ Select the correct counter input to which the signal is connected (A, B or Z)
- ⑤ *Frequency_CNT x/x* will output the signal frequency

AMPLIFIER OPTIONS		COUNTER GROUP SETTINGS	
Mode	① Frequency		
Threshold	② 2.4 V		
Retrigger	0.8 V		
Filter	③ 0.1 us		
SIGNAL ROUTING			
Source_A	Input_A	④	Invert <input type="checkbox"/>
<input type="checkbox"/> SW reset	Reset now		

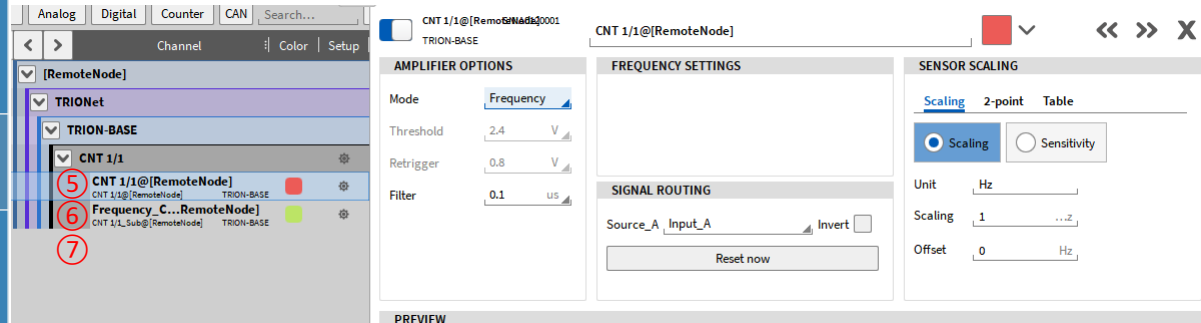




EXEMPLARY CHANNEL SETUP FOR FREQUENCY DETECTION (3)

There are 2 possibilities to detect the frequency of a signal connected to a CNT channel.
The second one is the following:

- ⑤ The channel *CNT x/x* will now output the detected frequency in [Hz]
- ⑥ The channel *Frequency_CNT x/x* will not output any data in this case and may be deactivated
- ⑦ The software channels *Angle_CNT x/x* and *Speed_CNT x/x* will not be created with these settings



Remark:

This possibility to determine the frequency was mainly integrated into OXGYEN to ensure the compatibility to old setup files which were created with OXYGEN version 2.5.1 or prior when the encoder support wasn't available in OXYGEN yet.
For creating a new setup, the first possibility of frequency detection is recommended.

