Specifications

Function (programmable)	counter, RPM meter or combined
Analog Input (programmable)	0(4)…20 mA, 0…5(10) V
Input Isolation	none
Digital Inputs (CLEAR, GATE)	dry NO contact or from NPN/PNP sensor
Maximum Input Frequency	500 Hz
Sensor Supply Output	12…24 VDC, 60 mA
Relay Outputs:	up to 4
Electromechanical relay	5A/250VAC with NO/NC contact
MOS gate	0.1A/60V, optically isolated
Transistor gate	open collector NPN 40mA/40V
Output for external SSR	5...24 VDC, 30 mA
- Out1	☐ relay, ☐ MOS, ☐ open collector, ☐ ext. SSR
- Out2	☐ relay, ☐ MOS, ☐ open collector, ☐ ext. SSR
- Out3	☐ relay, ☐ MOS, ☐ open collector, ☐ ext. SSR
- Out4	☐ relay, ☐ MOS, ☐ open collector, ☐ ext. SSR
Analog Output	☐ 0…20 mA, ☐ 4…20 mA, ☐ 0…10 V
Power Supply	☐ 230 VAC, ☐ 115 VAC, ☐ 90…250 VAC/DC, ☐ 24 VAC, ☐ 12…24 VAC/DC
Consumption	less than 6 VA
Operating Temperature / Humidity	-10…65 °C / 0…85% RH
Protection Class: front / terminals	☐ IP65, ☐ IP54 / IP20

Warranty and Support

……
serial number

……
manufacturing date

QC check mark ……(passed)
(stamp)

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QD-8.2.4-WC

Warranty

COMECO warrants this product to be free from defects in materials and workmanship for 2 years. If your unit is found to be defective within that time, we will promptly repair or replace it. This warranty does not cover accidental damage, wear or tear, or consequential or incidental loss. This warranty does not cover any defects caused by wrong transportation, storage, installation, or operating (see '**Specifications**').

Technical support

In the unlikely event that you encounter a problem with your COMECO device, please call your local dealer or contact directly our support team.

v8-11.09

COMECO
CONTROL & MEASUREMENT

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e-mail: info@comeco.org, WWW.COMECOGROUP.COM

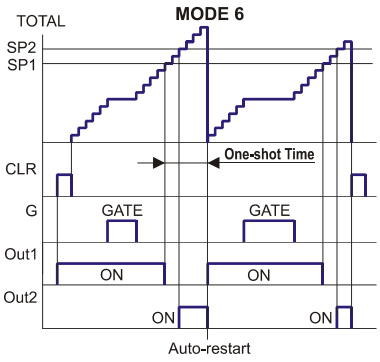
6-DIGIT MULTIFUNCTIONAL COUNTER WITH ANALOG INPUT

CT34

OPERATION MANUAL

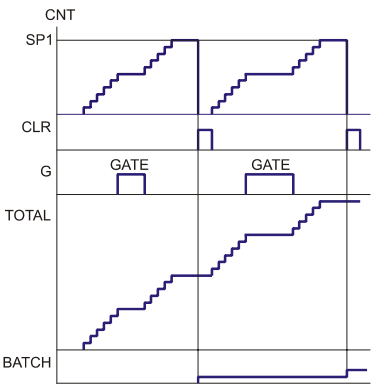
Please read this Operation Manual before mounting and operating!
Save the Manual for future references!

Modes of Operation – part III 10



Operation Mode 6 (Dosing Mode)
Mode = 6

- CT34 counts up and initializes at receiving CLEAR command or – when the value of **One-shot Time** is other than '0' – after the auto-restart time.
- Output Out1 activates with CLEAR command or after auto restart and stays ON until counter reaches SP1.
- With **Relay Output 2 Link** set to **cnt** and **Relay 2 Direction** – to **_/¯**, output Out2 activates when SP2 is reached.



TOTAL and BATCH

As a totalizer, CT34 integrates the input to total or total batches, counted from 0 to SP1.

- To see the **TOTAL** or **BATCH**, press and hold ⩓ or ⩔ while CT34 is at Basic Level, **Display Alternative 1** value is **totAL** , and **Display Alternative 2** – **bAtch**.
- To clear the **TOTAL**, press START CLEAR or use the CLEAR input (see '**CLEAR Functions**') while holding ⩓.
- To clear the **BATCH**, press START CLEAR or use the CLEAR input (see '**CLEAR Functions**') while holding ⩔.

RATE (flow-rate, RPM)

CT34 can act as RMP or flow meter depending on RATE-linked parameters (see parameter table).

Displaying 3

- While CT34 operates at Basic level, its display readings depend on device function and respective display parameters (see parameter table).
- During programming, the upper display shows the parameter symbol and the lower – its value.
- When the counter overflows (value > 999999), CT34 displays alternatively the leftmost (starting with **c**) and the rightmost value part at a 2-second interval.

Parameter Programming

- Changing decimal point position reflects the real value of all parameters linked to the parameter!

E.g.: changing **DP Position TOTAL** *value from (x1) to (x0.1) would change a* **Set Point 1** *value of 100 to 10.0!!!*

⚠ **Note:**
If the new value has not been confirmed and no key has been pressed for a certain period of time, value adjustment automatically ceases, and the parameter retains its initial value.

Setting numerical parameter value

- Enter parameter value adjustment mode (see '**Program Levels**').
- The whole part of the value appears on the display, and the rightmost digit blinks.
- To increase or decrease the blinking digit value, use respectively ⩓ or ⩔.
- To select another digit, press ◆.
- Confirm the adjusted value with ◆ + ⩓.
- If the new value is within the limits, CT34 accepts it and goes on to the next parameter. Otherwise, the device displays the same parameter and waits for a correct value to be set.

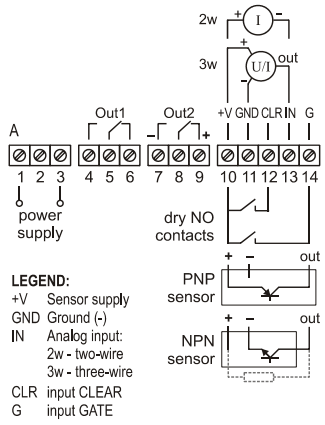
Setting symbolic parameter value

- Enter parameter value adjustment mode.
- Read the blinking parameter value.
- To change the value, use ⩓ and ⩔, and to confirm, press ◆ + ⩓.

Overview

CT34 with analog input is a fully programmable totalizing counter / rate (RPM) meter that can be adapted to a wide variety of counting, measuring, and controlling applications. It is equipped with two 6-digit LED displays and 2 control inputs allowing 7 different operating modes.
Up to 4 relays and 1 analog output may be installed, enhancing the counter to an integral part of your control application.

Mounting and Wiring



Mounting

Place CT34 into a 90x42 mm panel cut-out and tighten using the enclosed brackets.

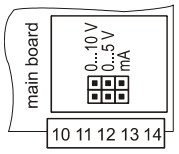
Wiring

- Connect CT34 in accordance with the wiring diagram on the left.
- If analog output is installed instead of relay output Out2 (see '**Specifications**'), wire it via terminals 7(-) and 9(+).

Important notes:

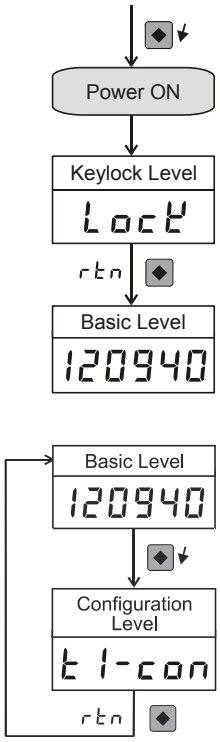
- *Power supply polarity does not matter!*
- *Each control input may be either dry contact or electronic.*
- *Sensor voltage may be taken from inside or from an external source.*
- *If the NPN sensor does not have a resistor, add an appropriate one (1...30 kΩ)!*

Analog Input Setting



- Remove the electronic block from the housing and find the configuration jumpers located on the main board.
- To set the desired analog input type (before programming), short out the respective jumper.

Program Levels – part I



STEP 1: Keyboard unlock

- Hold the ◆ key pressed at power-on, and release it after `LocK` appears on the display.
- Using ▲ or ▼, select `EYES` and set with ◆ + ▲.
- To return to Basic level, select `rtn` and press ◆.

Basic level

At Basic level, CT34 indicates the selected measured parameter with a resolution, according to the **Point Position** parameter.

STEP 2: Configuration level

This level contains the configuration parameters of the device.

- From Basic level, press and hold ◆.
- To enter Counter configuration, release the key while `t1-con` is displayed.
- Use ▲ or ▼ to choose a parameter (see the table on pages 6 & 7) and press ◆ to enter the parameter value adjustment mode.
- To return to Basic level, press ▲ + ▼ or select `rtn` and press ◆.

If no key has been pressed for 5 s, the device automatically exits Configuration level.

CLEAR Functions

functions (for CNT, TOTAL, and BATCH):	Parameter 'Clear Algorithm'
both CLEAR key and input are enabled to clear the counter	**Clear Algorithm** = `0`
only CLEAR input is enabled to clear the counter	**Clear Algorithm** = `1`
CLEAR input enables CLEAR key to clear the counter	**Clear Algorithm** = `2`
both CLEAR key and input are disabled	**Clear Algorithm** = `3`

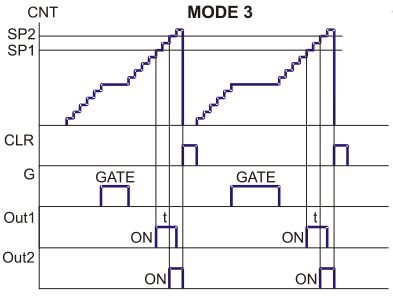
Calibrating

Note:

The calibration MUST be completed for ALL input types! Once started, all calibration steps must be carried out!

- Set **Calibration mode** to `YES`.
- Press and hold ◆ until `t1-cAL` displays.
- The upper display shows the calibrated input type and the lower one shows `------`.
- Set jumpers for 0...10 V range.
- Simulate 0 V input.
- Confirm calibration point `t1_u0` with ◆ + ▲ or go to the next with ▲.
- Simulate 10 V input.
- Confirm `t1_u10` or skip with ▲.
- Set jumpers for 0...5 V range.
- Simulate 0 V input.
- Confirm `t1_u0` or go to the next.
- Simulate 5 V input.
- Confirm `t1_u5` or go to the next.
- Set jumpers for mA range.
- Simulate 0 mA input.
- Confirm `t1_,0` or go to the next.
- Simulate 4 mA input.
- Confirm `t1_,4` or go to the next.
- Simulate 20 mA input.
- Confirm `t1_,20` or go to the next.
- To exit calibration, select `rtn`.

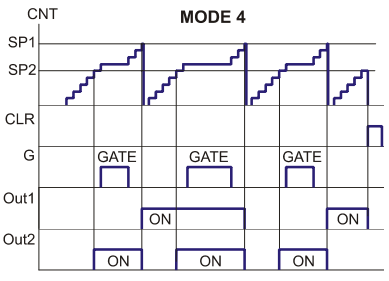
Modes of Operation – part II



Operation Mode 3

Mode = `3`

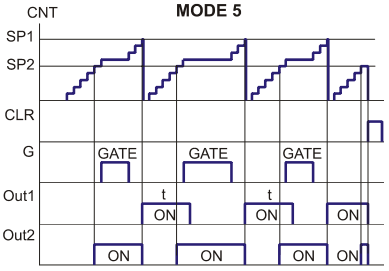
- CT34 counts up and initializes at receiving CLEAR command.
- Out1 activates at SP1 and stays ON for a period set with **One-shot Time** or until initialization.
- With **Relay Output 2 Link** set to `cnt` and **Relay 2 Direction** – to `_J--`, output Out2 activates when SP2 is reached.



Operation Mode 4

Mode = `4`

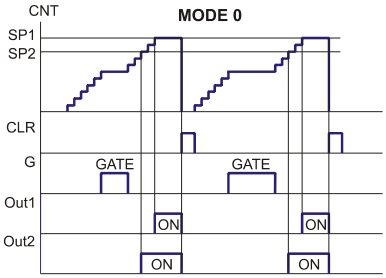
- CT34 counts up to SP1, automatically initializes, and starts a new cycle.
- Out1 switches ON/OFF alternatively when counter reaches SP1.
- With **Relay Output 2 Link** set to `cnt` and **Relay 2 Direction** – to `_J--`, output Out2 activates when SP2 is reached.



Operation Mode 5

Mode = `5`

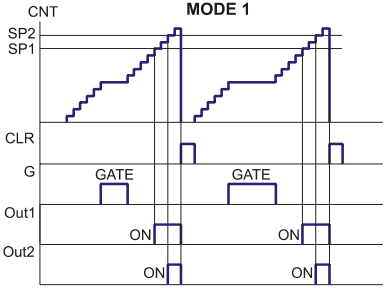
- CT34 counts up to SP1, automatically initializes, and starts a new cycle.
- Out1 activates at SP1 and stays ON for a period set with **One-shot Time**.
- With **Relay Output 2 Link** set to `cnt` and **Relay 2 Direction** – to `_J--`, output Out2 activates when SP2 is reached.



Operation Mode 0

Mode = 0

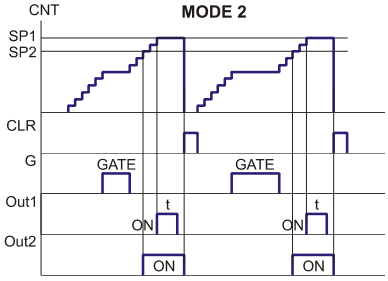
- CT34 counts up to SP1, stops, and initializes at receiving CLEAR command.
- Output Out1 activates when counter reaches SP1 and stays ON until initialization.
- With **Relay Output 2 Link** set to cnt and **Relay 2 Direction** – to _ ↓ - -, output Out2 activates when SP2 is reached.



Operation Mode 1

Mode = 1

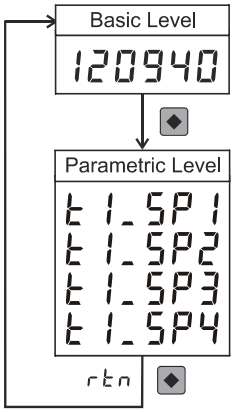
- CT34 counts up and initializes at receiving CLEAR command.
- Output Out1 activates when counter reaches SP1 and stays ON until initialization.
- With **Relay Output 2 Link** set to cnt and **Relay 2 Direction** – to _ ↓ - -, output Out2 activates when SP2 is reached.



Operation Mode 2

Mode = 2

- CT34 counts up to SP1, stops, and initializes at receiving CLEAR command.
- Output Out1 activates at SP1 and stays ON for a period set with **One-shot Time** or until initialization (one-shot).
- With **Relay Output 2 Link** set to cnt and **Relay 2 Direction** – to _ ↓ - -, output Out2 activates when SP2 is reached.



STEP 3: Parametric level

This level contains the control algorithm parameters. If no relay output is installed, this level does not show up.

- Enter from Basic level by pressing ◆ briefly.
- Use ⩓ and ⩔ to browse the respective group of parameters (see the table on pages 6 & 7).
- To enter the displayed parameter value adjustment mode, press ◆.
- To return to Basic level, press ⩓ + ⩔ or select rtn and press ◆.

⚠ *If no key has been pressed for 20 s, the device automatically exits Parametric level.*

STEP 4: Keyboard lock (if necessary)

- Hold the ◆ key pressed at power-on, and release it after LocY appears on the display.
- Using ⩓ or ⩔, select ESP or dYEY (see the table overleaf) and set with ◆ + ⩓.
- To return to Basic level, select rtn and press ◆.

Parameter	Symbol	Description	Value	Unit	Notes
Configuration Parameters (These parameters are part of Configuration level)					
Mode	t1_Mod	Operating mode selection	0 … 6	-	defines counter operating mode (see '**Modes of Operation**')
Save	t1_SAv	Saves cnt value at power-off	no, YES	-	YES saves cnt current value in non-volatile memory
Clear Algorithm	t1_cAG	Function of CLEAR input (key)	0 ... 3	-	defines CLEAR input and key (see '**CLEAR Functions**')
DP Position RATE	t1_dPr	RATE display decimal point position	x1, x0.1, x0.01, x0.001	-	**affects all parameters linked with RATE and with the same units**
Input Type	t1_inP	Analog input signal type	0...20, 4...20, 0...10, 0...5		0...20 mA, 4...20 mA, 0...10 V, 0...5 V (see '**Analog Input Setting**')
Input Low	t1_iLo	RATE value corresponding to LOW input range	-10000 … 10000	ISU	ISU = input signal units (e.g.: l/min)
Input High	t1_iHi	RATE value corresponding to HIGH input range	-10000 … 10000	ISU	
Display Offset	t1_oFS	Adds a constant to the measured input value	-10000 … 10000	ISU	display offset
Filter Time	t1_Ft	Relative time constant of the input filter	0 … 255	-	higher value for better filtration
Filter Band	t1_Fb	Action zone of the input filter	0 … 3000	-	
DP Position TOTAL	t1_dPt	TOTAL display decimal point position	x1, x0.1,..., x0.00001	-	**affects all parameters linked with TOTAL and with the same units**
DP Position SCALE	t1_dPS	SCALE display decimal point position	x1, x0.1,..., x0.00001	-	**affects SCALE TOTAL value**
Scale TOTAL	t1_ScL	TOTAL scaling coefficient	0.00001 … 999999	-	TOTAL = RATE*SCALE*DP (allows displaying TOTAL in other units)
Time Base RATE	t1_tbS	(Flow) RATE time base	sec, min, hour, day	-	e.g.: l/s, t/h, m^3/day
Low Flow Cutoff	t1_coF	Minimum flow rate limit	-10000 … 10000	ISU	all values under the limit will be accepted as '0'
Linear Transformation	t1_Lin	Input value transformation after measurement	Lin, SQrt	-	Lin - linear; SQrt - further square root transformation (2)
One-shot Time	t1_oSt	Duration of the one-shot output	0 … 3000.0	sec.	for modes 2, 3, and 6 (in mode 6, value > 0 is auto-restart time)
Display Direction	t1_ddr	Display counting direction	uP, dn	-	uP displays from 0 to SP1; dn displays from SP1 to 0
Display 1	t1_d1L	Parameter displayed on upper display	cnt ti, ME totAL bAtch rAtE	-	cnt - current count (can be zeroed/manipulated in different modes); ti, ME - time passed after cnt zeroing; totAL - total count (special zeroing only); bAtch - batch count (special zeroing only); rAtE - (flow)rate / RPM;
Display 2	t1_d2L	Parameter displayed on lower display			
Display Alternative 1	t1_d1A	Alternative parameter on upper display (press ⏫)			
Display Alternative 2	t1_d2A	Alternative parameter on lower display (press ⏬)			
Relay Output 2 Link (1)	t1_r2L	Defines parameter linked to **Out2**			
Relay Output 3 Link (1)	t1_r3L	Defines parameter linked to **Out3**			
Relay Output 4 Link (1)	t1_r4L	Defines parameter linked to **Out4**			
Relay 2 Direction (1)	t1_r2d	Control action direction of **Out2**	_J--, --L_	-	_J-- - relay ON over set-point; --L_ - relay ON under set-point
Relay 3 Direction (1)	t1_r3d	Control action direction of **Out3**			
Relay 4 Direction (1)	t1_r4d	Control action direction of **Out4**			
Calibration mode	t1_cAL	Enable access to calibration mode	no, YES	-	YES enables calibration mode
Parameters of the control algorithm (These parameters are part of Parametric level)					
Set Point 1 (1)	t1_SP1	Set-point value of relay output **Out1**	-99999 … 999999		**Out1 is always linked to TOTAL and the Operation Modes**
Set Point 2 (1)	t1_SP2	Set-point value of relay output **Out2**	-99999 … 999999		see **Relay Output 2 Link**
Set Point 3 (1)	t1_SP3	Set-point value of relay output **Out3**	-99999 … 999999		see **Relay Output 3 Link**
Set Point 4 (1)	t1_SP4	Set-point value of relay output **Out4**	-99999 … 999999		see **Relay Output 4 Link**
Keyboard locking Parameter					
Keyboard Lock Mode	LocK	Keyboard locking mode	KEY, ESP, dKEY	-	ESP - enables set-point; KEY - enables all; dKEY - all locked

(1) These parameters do not appear if the respective relay is not installed!

(2) If square root transformation is selected, the RATE value will be always displayed with decimal point!