OP3122-V01

selec XTC262/XTC562
Operating Instructions



48x48mm 72x72mm

SPECIFICATIONS

Display	6 (White) + 6 (Orange) digits, XTC262: 0.60'' height, 7 seg LED XTC562: 0.40'' height, 7 seg LED
No. of keys	3
Supply Voltage	90 to 270 VAC/DC, 50/60Hz,4VA
Sensor Supply	12VDC, 30mA (±10%) (use external supply if current>60mA)
Range	Total : Least count ,0.0001 0.001, 0.01, 0.1,1 Timer: 9999.99/99999.9/999999 sec, 9999.59 min : sec / 99999.9 min 999999 min / 9999.59 hr: min 99999.9/999999 hr
Relay	5A@250V AC/30VDC

ENVIRONMENTAL CONDITIONS

Temperature	Operating : 0 - 50°C, Storage : -20 - 75°C.
Humidity	95% RH
Mounting	Panel Mounted
Weight	XTC262: 200gms XTC562: 120gms

INSTALLATION INSTRUCTIONS

1. This equipment, being built-in-type, normally becomes part of the main control panel and the terminals do not remain accessible to the user after installation.
2. Conductors must not come in contact with the internal circuitry of the equipment else it may lead to a safety hazard that may endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between the power source and supply terminals to facilitate power 'ON' or 'OFF' function.
4. The equipment shall not be installed in environmental conditions other than those specified in this manual.
5. Since this equipment forms part of the main control panel, its output terminals get connected to the host equipment. Such equipment shall also comply to EMI / EMC and safety requirements like CE standard procedure.
6. Thermal dissipation of equipment is met through ventilation holes provided on housing of equipment. Obstruction of these ventilation holes may lead to a safety hazard.
7. The output terminals shall be loaded strictly as per the values / range specified by the manufacturer.

ELECTRICAL PRECAUTIONS DURING USE

Electrical noise generated by switching of inductive loads can create momentary disruption, erratic display, latch up, data loss or permanent damage to the instrument.

To reduce noise :

Use of Selec make Snubber across load is recommended.
Snubber Part no. : SNUBBER
The unit is not intended for outdoor use.
The power connection cable must have a cross-section of at least 1mm^2 and insulation capacity of at least 1.5kV.
The output connections must not be loaded beyond the specified values/range.
The unit must not operate in presence of heating source, Caustic vapors, oil, steam, vibration or impact etc.

⚠SAFETY PRECAUTIONS

This manual is meant for personnel involved in wiring, installation, operation and routine maintenance of the equipment. All safety related conditions, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure operator and instrument safety. Any misuse may impair the Protection provided by the equipment.

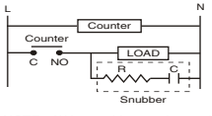
⚠ **CAUTION :** Read complete instructions prior to installation and operation of the unit.

⚠ **CAUTION :** Risk of electric shock.

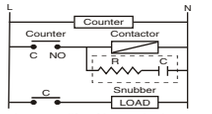
NOTE : Diagram is applicable only for 230V relay outputs

TYPICAL CONNECTIONS FOR LOADS

For load current < than 0.5A



For higher loads use interposing relay / contactor



NOTE : A)Use snubber as shown above to increase life of internal relay
B)Use separate shielded wires for inputs

CONFIGURATION SCHEME (Parameter setting)

1) Turn power on.
2) To enter into programming mode press ▼ for 3 seconds.

Programming mode:

3) To change the value of a particular parameter press (✔ or ■)+ (▲ or ▼).
▲ = Increment, ▼ = Decrement
4) To save a particular setting and to move to next / previous parameter press (▲ / ▼) respectively.
5) To exit from programming mode press ▼ for 3 seconds.

Online mode:

6) Lower display parameter can be altered by single press ▲ followed by 3rd point.
7) To view batch total and count total in Timer/ Counter single press ▼ once.
8) To Reset Timer, Counter , Batch value & Count value press ▲ for 3 seconds followed by 3rd point then press ▲ for 3 seconds to reset that particular parameter.
9) To Set Time, Count, Batch value for a particular mode press(✔ or ■)for 3 seconds followed by 3rd and 4th point. To exit the Setting mode press (✔ or ■) for 3 seconds.
10) To Lock, Unlock, Read only press (▲ + ▼) for 3 seconds Enter lock Id followed by 3rd point. (Default - 2727 can be altered in same mode).

TIMER FUNCTIONALITY:

Parameter	Range	Default value
Mode	Timer, Counter, Rate	Timer
Relay 1 mode	On, Int, Cyc on, Cyc off, Id-S,Id-P,MR	ON delay
Motor reverse	Manual/Auto	Manual
Start 1 time ON 1 time OFF 1 time Pause time	Second/Minute/Hours (9999.99,99999.9,999999)	Second 9999.99
Relay2 function	Timer/batch mode/not connected	Timer
Relay2 mode	On, Int, Cyc on, Cyc off	On delay
Start 2 time ON 2 time OFF 2 time	Second/Minute/Hours (9999.99,99999.9,999999)	Second 9999.99
Timing direction	Up/Down	Up
Start Input	Pulse/Gate/Level	Pulse
Front Panel Batch reset	Yes/No	Yes
Front Panel reset	No/Yes	No
Power on reset	No/Yes	No
Factory reset	RST0.....5	0

COUNTER FUNCTIONALITY:

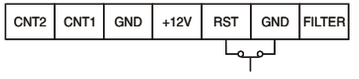
Parameter	Range	Default value
Scale factor Mantissa	0.00001 to 9.99999	1.00000
Scale factor Exponent	-5 to -1 & 0 to 2	0
Resolution	0.0001 to 1	0
Counting mode	Uni-direction, Bi-direction, Quadrature	Unidirectional
Count direction	Up count, Down count	Up count
Relay1 Operating Mode	On delay, Interval	On delay
Relay2 Operating Mode	On delay, Interval, Batch	On delay
Reset Mode	None, Auto reset, Time pulse repeat	None
Input Frequency	15000Hz, 10Hz	15000Hz
Rate unit	RPS, RPM, RPH	RPS
Over run/ Non over run	Over run, Non over run	Over run
Front panel Reset	Yes, No	Yes
Reset Total	RST0.....5	RST0
Factory reset Condition	RST0.....5	RST0
Hardware Selection	PNP, NPN	PNP

RATE FUNCTIONALITY:

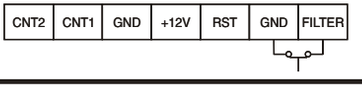
Parameter	Range	Default value
Scale factor Mantissa	0.00001 to 9.99999	1.00000
Scale factor Exponent	-5 to -1 & 0 to 2	0
Power ON Delay	000 to 999	1
Alarm Delay	000 to 999	1
Hysteresis	00 to 99	00
Resolution	0.0001 to 000001	000000
Rate Unit	RPS, RPM, RPH	RPS
Factory reset Condition	RST0.....5	0
Hardware Selection	PNP, NPN	PNP

RESETTING

By front key : Press ▲ key continuously for 3 seconds twice. The counter resets and starts counting again.
Remote reset : The unit can be reset from a remote push button as per connections shown in the figure :



NOTE : In some applications, proximity sensors pick up high frequency noise from nearby switching circuits like AC/ DC drives. These get counted by the counter which then shows erroneous count/ rate reading. By shorting terminals 13-14 for as shown in fig below these high frequency spurious pulses are filtered, by limiting input frequency to about 200Hz (12000RPM)



EMC Guidelines :

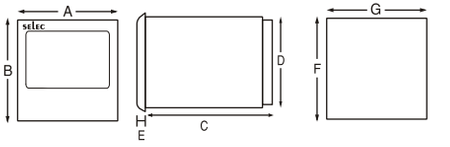
1. Use proper input power cables with shortest connections and twisted type.
2. Layout of connecting cables shall be away from any internal EMI source.

MAINTENANCE :

1. To avoid blockage of ventilation holes, clean the equipment regularly using a soft cloth.
2. Do not use Isopropyl alcohol or any other organic Solvents for cleaning.

MECHANICAL INSTALLATION

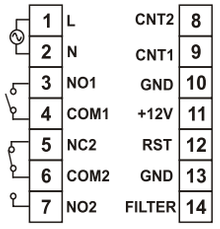
Outline Dimensions (in mm) | **Panel Cutout (in mm)**



MODELS \ DIM	A	B	C	D	E	F	G
XTC262	72	72	83.7	67	4.5	69	69
XTC562	48	48	69	40	3	44	44

TERMINAL CONNECTIONS

XTC262/XTC562

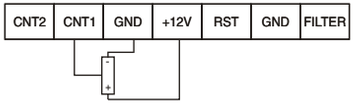


COUNTER / RATE SPECIFIC SPECIFICATIONS

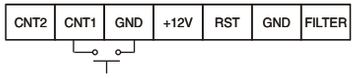
WIRING DIAGRAM FOR COUNT INPUT

(**Sensor color codes :-**
Red = +12V, Green = CNT, Black = GND
Brown = +12V, Black = CNT, Blue = GND)

PROXIMITY (NPN/PNP)

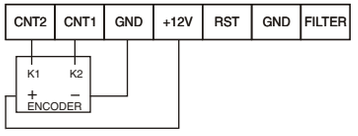


CONTACT / SWITCH (NPN)



NOTE : For Uni-direction always connect CNT2 & GND.

ENCODER



NOTE :
1. If the sensors (Proximity / Encoder) require more than 30mA current, use external power supply to power the sensors

Set Points	Two set points, each programmable from 0.0001 to 999999
Rate (Rt) / Batch(Bt) Selection	User selectable Rate / Batch at lower display
Relay 2 operation modes	User selectable Relay 2 operation 1) Operate in On delay/ Interval 2) Operate on Set Batch (SPBT)
Operating modes Counter	On delay, Interval, Time pulse repeat, Auto reset
Counting modes	Unidirectional, Quadrature, Bi - directional Direction : Up , Down
Accuracy	Rate : 0.05%
Count Inputs	5 to 30VDC from proximity switches, encoders, solid state devices, potential free contacts like limit switches, relays
Maximum Input Frequency	Slow Speed :- 10Hz High Speed :- 15kHz
Quadrature mode	In quadrature mode maximum speed is 5 kHz
Scale Factor	Programmable form 0.00001 to 9.99999 x 10^n Where n = -5, -4, -3, -2, -1, 0, 1, 2

TIMER SPECIFIC SPECIFICATIONS

Timer Ranges	999999, 99999.9, 9999.99 seconds 999999, 99999.9, 9999.59 minutes 999999, 99999.9, 9999.59 hours
Maximum & Minimum values	Seconds 0 to 999999 s Minutes 0 to Hours 0 to
Start Input	Gate, Pulse, Level

Values setting and Reset

As soon as the unit is given power Timer mode will be selected as Factory default mode.

Setting Parameters
1) To set values of different parameters long press(✔ or ■).
2) Blinking digit indicates that particular digit will be altered.
3) Press (✔or ■) + (▲ or ▼) to increment / decrement a particular digit which is blinking.
4) Press (✔or ■) to move to next digit.
5) Press (▲ or ▼) to move to next / previous parameter.
6) Long press (✔or ■) to exit after setting the required parameter.

* NOTE : Role-over is enabled.

To Reset different parameter
1) Long press ▲ to enter to reset different parameter.
2) Press (✔or ■) + (▲ or ▼) to change a particular parameter.
3) Long press▲ to Reset that parameter.

* NOTE : Unit will auto exit the mode without resetting if point number 3 is not performed.

Different reset in Timer / Counter

Timer	Batch reset
Counter	Count reset, Batch reset

Different count total in Timer / Counter

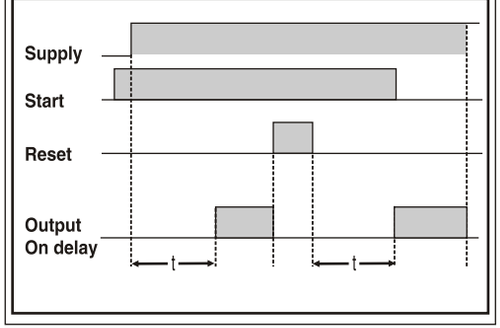
Timer	Batch total
Counter	Count total, Batch total

Detailed Operation of Timer

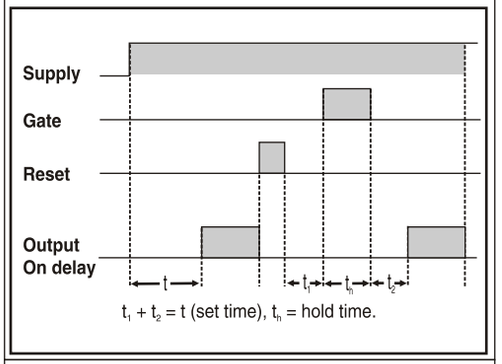
In Timer mode, the unit changes the state of the relay's operation based on the internal program and the time value set.

Different start input in timer

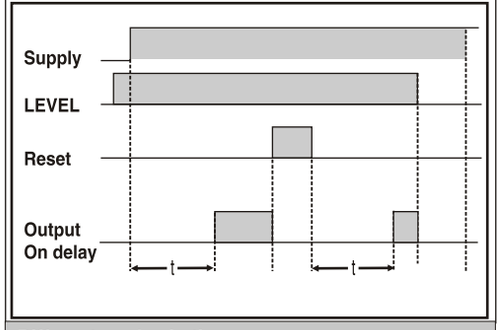
Pulse Start
In this user has to short terminal 9 and 11 to give the start input to the timer.
Typical application of a continuous start in ON DELAY.



GATE Start
In this case, the timer will start on in own after we exit programming mode no need of external trigger.
Typical application of a gate start in ON DELAY.

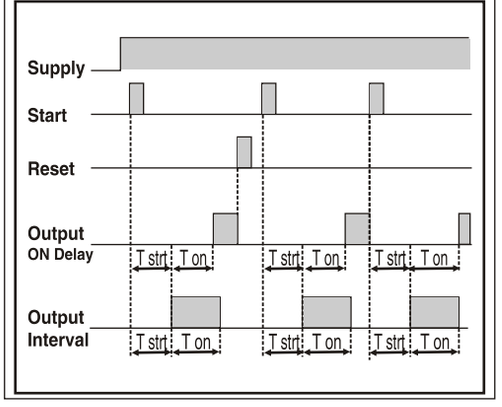


LEVEL Start
In this the timer will start only if terminal 9 and 11 are shorted continuously if the shorting is removed the unit will reset itself.
Typical application of Level start in ON DELAY.

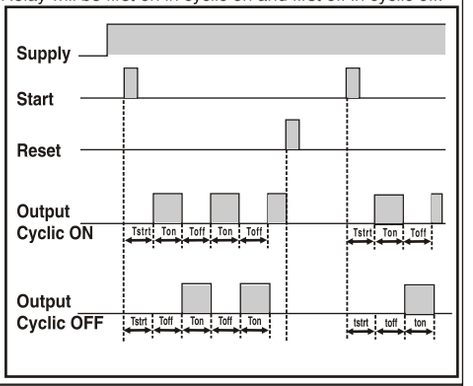


Different modes in timer

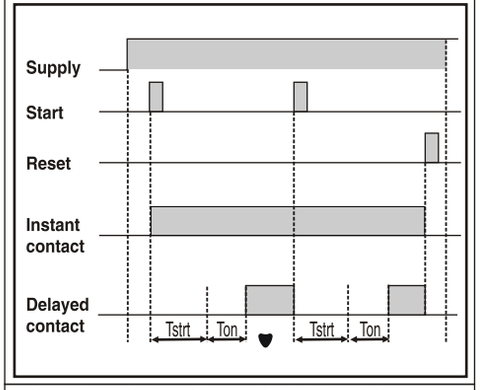
ON DELAY / INTERVAL
After required start is triggered timing will start, no action will be performed in Start time, Relays will get on after the on time in completed in on delay mode and during the on time in interval mode.



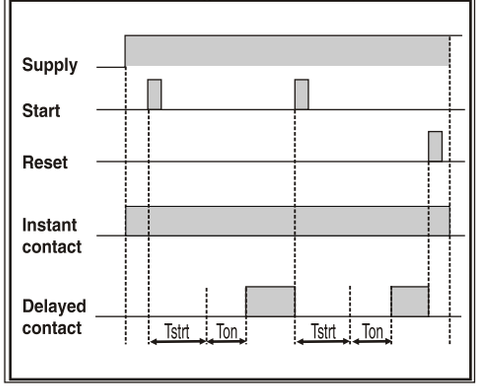
CYCLIC ON / OFF
After required start is triggered timing will start, no action will be performed in Start time, the relays will toggle between on and off for fixed number cycles defined earlier. Relay will be first on in cyclic on and first off in cyclic off.



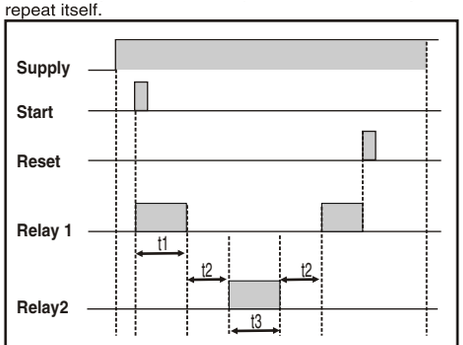
INSTANTANEOUS + DELAYED AT START PULSE
After required start is triggered relay2 will get on instantly and relay1 will work in on delay mode.



INSTANTANEOUS + DELAYED AT POWER ON
At power on relay2 will get on and relay1 will work in on delay mode according to its own start input.

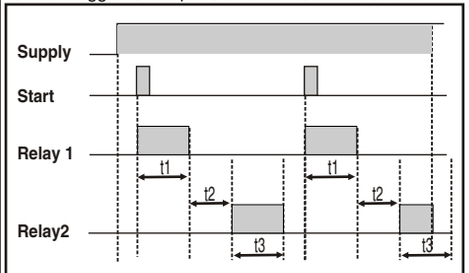


MOTOR REVERSE (AUTO)
After required start is triggered timing will start, first relay1 will turn on then pause time where both the relays will be off then relay2 will be on then pause time and the cycle repeat itself.



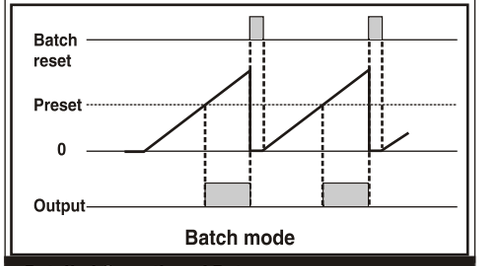
t1 = On time of relay1, t3 = On time of relay2,
t2 = Pause time

MOTOR REVERSE (MANUAL)
After required start is triggered timing will start, first relay1 will turn on then pause time where both the relays will be off then relay2 will be on then the operation stops and for next trigger. Short pin 8 & 10 to reset total count.



t1 = On time of relay1, t3 = On time of relay2,
t2 = Pause time

BATCH MODE
Applicable when relay2 is in batch mode. Relay2 will turn when the batch count will reach the batch value.



Batch mode

Detailed Operation of Rate

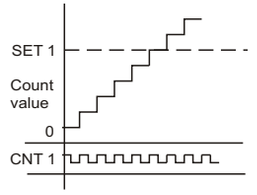
Power on delay:
If alarm condition is present at power ON, the alarm output will be activated only after the time set as, Power on delay.
Alarm Delay
When alarm condition occurs, the alarm output will be activated only after the time set as alarm delay.
Note : At Power ON, the higher of the two delay values is considered.
Hysteresis
Low Alarm is activated when Rate <= LA value.
It turns off when, Rate > (LA value + Hysteresis).
High Alarm is activated when Rate >= HA value.
It turns off when, Rate < (HA value - Hysteresis).

Detailed Operation of Counter

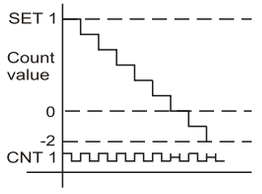
1. COUNTING DIRECTION

a. Unidirectional :
The unit counts the number of pulses received at the CNT1 input and can be programmed to count upwards from zero towards the set point
(***Up counting***), or to count downwards from the set point to zero (***down counting***).
Note:- For Unidirection Mode CNT2 should always be connected to GND.

Up counting (Overrun)

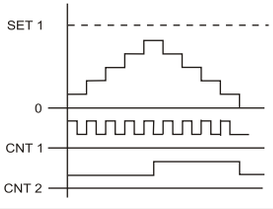


Down counting (Overrun)

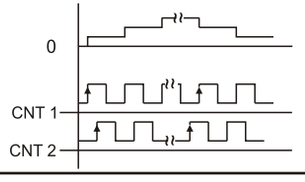


In Overrun mode, the unit continues to count above the set point.

b. Bi-directional :
In the Bi-directional mode of counting(UP Direction), the CNT2 input determines the count direction. If the CNT2 input is at GND, the unit counts up (increments). If the CNT2 input is +12V, the unit counts down (decrements).
In the Bi-directional mode of counting(DOWN Direction), the CNT2 input determines the count direction. If the CNT2 input is at GND, the unit counts down (decrements). If the CNT2 input is +12V, the unit counts up (increments).



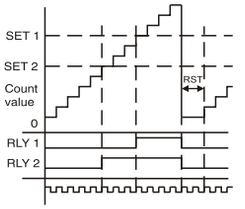
C. Quadrature :
The Quadrature mode is suitable for using with sensors which generate 2 channels of output in quadrature (phase shift) e.g. Rotary encoders. The unit counts up (increments), if the CNT1 input transitions precede the CNT2 input transitions and counts down, if the CNT2 input transitions precede the CNT1 input transitions.



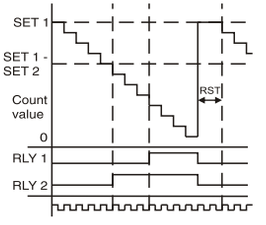
2. MODES OF OPERATION

a) On delay :
The output is energised at the end of the counting cycle (i.e. count value = set value) & remains on till unit is reset.
When the number of pulses received is equal to SET2, relay 2 is switched ON, and when the number of pulses received equals Set1, relay 1 is switched ON. Both the outputs remain ON till the unit is reset.

Up counting (overrun mode)

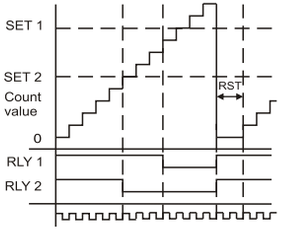


Down counting

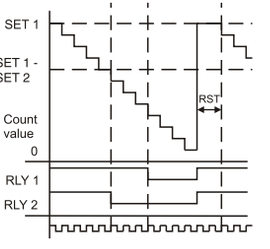


b) Interval:
The output is energised at the start of the counting cycle and de-energised on its completion.
When the number of pulses received equal to SET2, relay2 is switched OFF, and when the number of pulses received equal to Set1, relay 1 is switched OFF. These relays remain OFF till the unit is reset.

Up counting (overrun mode)

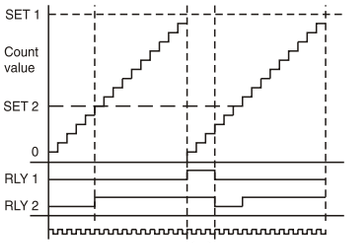


Down counting



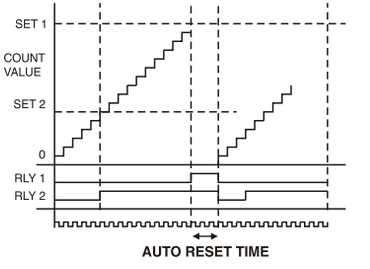
c) Time Pulse Repeat (TPR) :
The output changes state (according to the On delay or Interval mode selected) for a programmed pulse time (t), at the end of the count cycle. After the set pulse time, the count resets automatically & count cycle repeats. Counting continues uninterrupted during the pulse time.

Time Pulse Repeat (Up Counting, On Delay)



d) Auto-reset mode :
The output energises (according to the On delay or Interval delay mode selected) at the end of the count cycle for the programmed Auto reset time, after which the counter automatically resets and begins the next count cycle.
The unit remains reset for the Auto reset time and ignores count pulses received during this duration. It resumes operation only after this period has elapsed.

Auto Reset Mode (Up Counting, On Delay)



Overrun / Non Overrun feature:
Overrun: In overrun mode, the counter continues counting, after the SET1 value has been crossed.
Non overrun: In non overrun mode, the counter stops counting, after the SET1 value is reached and restarts counting only after reset.

SCALE FACTOR
The user programmable scale factor facilitates the direct reading in desired engineering unit.
The counter multiplies the number of pulses received at the count input with the scale factor, and displays the result.
Count display = No. of pulses received x scale factor
Rate display = Number of pulses received per minute x scale factor or No. of pulses received per hour x scale factor.

The scale factor consists of two parts, mantissa and exponent.
The mantissa can be set from 0.00001 to 9.99999 and the exponent can be set from -5 to +2. The scale factor is arrived at as:
Scale factor = Mantissa X $10^{Exponent}$