



PROGRAMMABLE DIGITAL TIMER with "count continuation and count holding" functions and with two outputs

EC 3-102

GENERAL CHARACTERISTICS

- * Frontal size: 74 x 32 mm.
- * Power supply: 12 Vac/dc (standard) or 12-24 Vac/dc (on request).
- * Signalling buzzer included.
- * Custom configuration through keyboard or Personal Computer.
- * Easy integration with remote assistance or remote management.
- * Four digits display height 10 mm.
- * "Count continuation" function.
- * "Count holding" function.
- * Possibility of programming: time base for each status, inputs and outputs functionality, modality of "Start" and "Stop" inputs enabling, count mode (up or down), length of each status.
- * Two remote inputs for to start and to stop a cycle of counting.
- * Two 6 (3) A at 250 Vac relay outputs.

EC 3-102 is a programmable digital timer with two outputs designed to meet the applications connected to **time intervals**.

A complete cycle of counting has **five status of programmable length** and connected in cascade since, the end of one, automatically determines the passage to the following one; besides that, the instrument offers the possibility of programming the **time base** for each status, the **modality of "Start" and "Stop" inputs enabling**, the **count mode** (up or down) and the possibility to display the count during each status.

The **"count continuation"** function permits to continue the count when a cycle of counting ends and the **"count holding"** function permits to interrupt and to take again a count on run.

The presence on mass production of two remote inputs for to start and to stop a cycle of counting, makes this device particularly indicated to the use in TTL logics, increasing its field of application.

The two 6 (3) A at 250 Vac relay outputs with change-over contact (output 1) and N.O. contact (output 2) are supplied in standard version and their functionality is widely configurable: as option it is possible to request outputs with low voltage signal, suitable to drive the S.S.R. modules (solid state relay).

The signalling buzzer and the flashing indications have been designed in order to catch user's attention at the end of a cycle of counting.

FUNCTIONING

A complete cycle of counting has five status connected in cascade since, the end of one, automatically determines the passage to the following one.

"Status 0" (dedicated parameters t 1, t 4, t 7, t12, t21, t25):

At any reset or after a "Stop" input the instrument automatically moves to the "Status 0" (the modality that enables the "Stop" input can be established with the parameter "t 5").

For all the length of this status on the display appear:

- the time to be counted during the "Status 2" if the parameter "t 6" has value 0
- the indication "00:00" if the parameter "t 6" has value 1

the lighting indicators located in the middle of the display are lighted, the outputs are deactivated.

A "Start" input during this status forces the instrument to the "Status 1" (the modality that enables the "Start" input can be established with the parameter "t 4").

"Status 1" (dedicated parameters t 0, t 2, t 5, t 6, t 8, t11, t12, t21, t25, t31):

The "Status 1" permits to delay the activation of the following status.

During this status the instrument counts the time established with the parameter "t11", according to the time base established with the parameter "t 0".

For all the length of this status on the display appear:

- the time to be counted in the following status if the parameters "t 6" and "t31" have value 0
- the indication "00:00" if the parameter "t 6" has value 1 and the parameter "t31" has value 0
- the countdown of the time to be counted in this status if the parameter "t 6" has value 0 and the parameter "t31" has value 1
- the count up of the time to be counted in this status if the parameters "t 6" and "t31" have value 1





the lighting indicators located in the middle of the display alternately flash, the outputs are not activated.





At the end of the established time the "Status 1" ends and the device automatically moves to the "Status 2".


NOTES: - one "Stop" input during this status forces the instrument to the "Status 0", on the display remains the indication showed during the "Status 0".

"Status 2" (dedicated parameters t 2, t 5, t 6, t 8, t10, t12, t21, t25, t32):

During this status the instrument counts the time established with the keys located on the frontal panel, according to the time base established with the parameter "t10".

To set the time to be counted during the "Status 2" push and release the key  : the most important side of the display flashes; operate with the keys  or  within 4 seconds since the first pressure on key  to modify its value.

To set the value of the least important side of the display push and release the key  during the flashing of the most important side of the display: the least important side of the display flashes; operate with the keys  or  within 4 seconds since the second pressure on key  to modify its value.

To leave the procedure of setting of the time to be counted during the "Status 2" wait 4 seconds without operate on the keys (time-out exit) or push and release for a third time the key .

For all the length of this status on the display appear:

- the time to be counted in this status if the parameters "t 6" and "t32" have value 0
- the indication "00:00" if the parameter "t 6" has value 1 and the parameter "t32" has value 0
- the countdown of the time to be counted in this status if the parameter "t 6" has value 0 and the parameter "t32" has value 1
- the count up of the time to be counted in this status if the parameters "t 6" and "t32" have value 1

the lighting indicators located in the middle of the display flash at the same time, the output 1 is activated.

At the end of the established time the "Status 2" ends and the device automatically moves to the "Status 3".

NOTES: - if the parameter "t12" has value 1, the output 1 always is activated except during this status
 - if the parameter "t25" has value 2, the output 1 gets activated/deactivated with the same modality of the output 2, respecting the parameter "t12" only
 - one "Stop" input during this status forces the instrument to the "Status 0", on the display remains the indication showed during the "Status 0".

"Status 3" (dedicated parameters t 0, t 2, t 5, t 6, t 8, t12, t20, t21, t25, t33):

The "Status 3" permits to delay the activation of the following status.

During this status the instrument counts the time established with the parameter "t20", according to the time base established with the parameter "t 0".

For all the length of this status on the display appear:

- the indication "00:00" if the parameters "t 6" and "t33" have value 0
- the time counted in the preceding status if the parameter "t 6" has value 1 and the parameter "t33" has value 0
- the countdown of the time to be counted in this status if the parameter "t 6" has value 0 and the parameter "t33" has value 1
- the count up of the time to be counted in this status if the parameters "t 6" and "t33" have value 1

the lighting indicators located in the middle of the display alternately flash, the outputs are not activated.

At the end of the established time the "Status 3" ends and the device automatically moves to the "Status 4".

NOTES: - one "Stop" input during this status forces the instrument to the "Status 0", on the display remains the indication showed during the "Status 0".

"Status 4" (dedicated parameters t 2, t 3, t 5, t 6, t 7, t 8, t12, t21, t22, t23, t24, t25, t34):

During this status the instrument counts the time established with the parameter "t24", according to the time base established with the parameter "t23".

For all the length of this status the signalling buzzer is activated according to the modality established with the parameter "t 3", on the display appear:

- the indication "00:00" if the parameters "t 6" and "t34" have value 0
- the time counted during the "Status 2" if the parameter "t 6" has value 1 and the parameter "t34" has value 0
- the countdown of the time to be counted in this status if the parameter "t 6" has value 0, the parameter "t34" has value 1 and the parameter "t22" has value 2
- the count up of the time to be counted in this status if the parameters "t 6" and "t33" have value 1 and the parameter "t22" has value 2

the lighting indicators located in the middle of the display flash at the same time, the output 2 is activated.

At the end of this status:

- if the parameter "t 7" has value 0, the instrument automatically moves to the "Status 0", on the display remains the indication showed during the "Status 0" (the modality that ends the "Status 4" can be established with the parameter "t22")
- if the parameter "t 7" has value 1 and the parameter "t22" has value 2, the instrument automatically moves to the "Status 1" and it continues the count.

NOTES: - if the parameter "t21" has value 1, the output 2 always is activated except during this status
 - if the parameter "t25" has value 1, the output 2 gets activated/deactivated with the same modality of the output 1, respecting the parameter "t21" only
 - one "Stop" input during this status forces the instrument to the "Status 0", on the display remains the indication showed during the "Status 0".

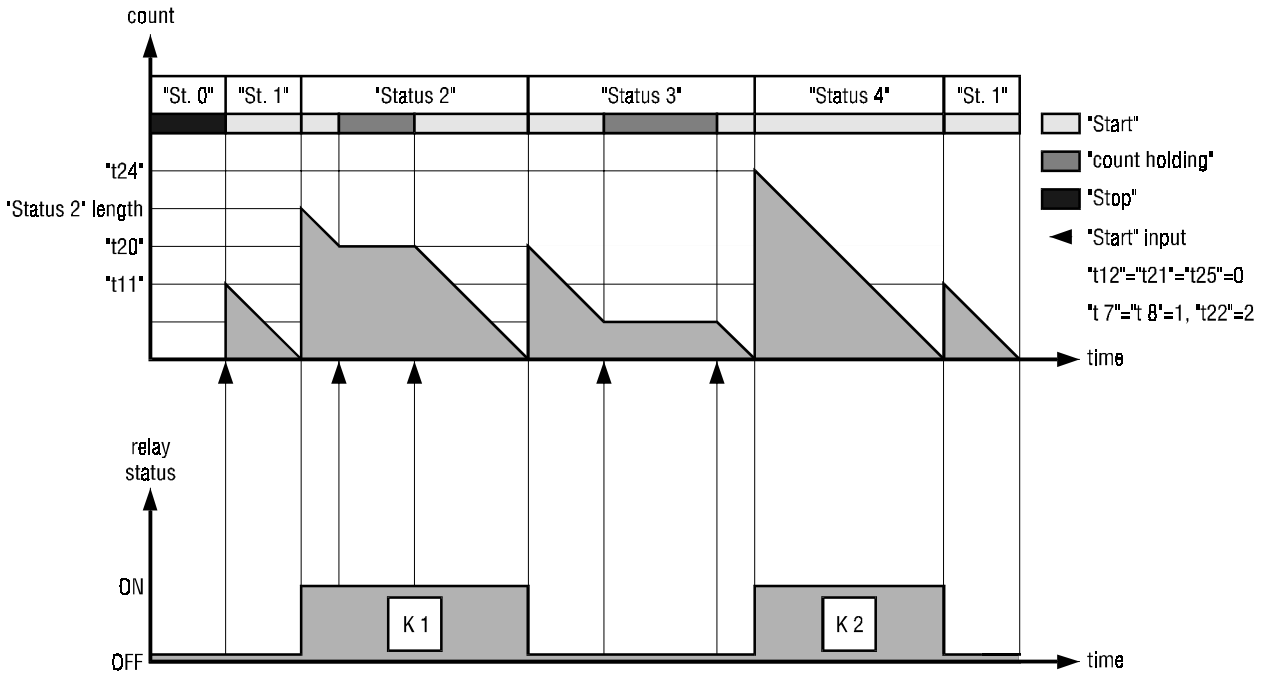
"Count holding" function (dedicated parameter t 8):

"Count holding" function was studied to permit to interrupt and to take again a count on run.

Function depends from the parameter "t 8" as indicated:

- if the parameter "t 8" has value 0 the function is inactive
- if the parameter "t 8" has value 1 the function can be activated/deactivated through a "Start" input; for all the length of the "count holding" on the display flashes the indication showed at the moment of the function activation
- if the parameter "t 8" has value 2 the function is active during the activation of the "E 1" remote input only.

EXAMPLE OF FUNCTIONING



INSTALLATION

For a proper installation, take note of the attached indications; be sure that the conditions of use (environment temperature, humidity, power supply voltage) are inside the indicated limits; do not overload the relay outputs keep inside the indicated limits.

WARNING: the instrument is not protected from overloads; so it is necessary to give the outputs the suitable protections.

Besides that, according to the source of power supply, find a protection able to limit the quantity of current absorbed by the device in case of failure.

ALARMS

"E:2" flashing on the display and buzzer beeping intermittent (**corrupted memory data alarm**) indicate the failure of the memorised configuration data: try to switch the power supply off and then switch it on; if to the restart the alarm condition does not disappear it is necessary to change the instrument (all the outputs are deactivated).

PARAMETERS CONFIGURATION

The configuration parameters programming can be done during the status "Status 0" only, if there is not a **corrupted memory data alarm**.

Programming procedure for the parameters "t11", "t20" and "t24"

- A) Keep pushed and at the same time for 4 seconds at least: on the display appear "t 0".
- B) Push or to select the parameter to modify.
- C) Push and release the most important side of the display flashes;
- operate with or within 4 seconds since the first pressure on to modify its value.
- D) Push and release for a second time during the flashing of the most important side of the display: since now the least important side of the display flashes;
- operate with or within 4 seconds since the second pressure on to modify its value.
- E) After the modify push and release for a third time or wait 4 seconds without operate on the keys (time-out exit).

Programming procedure for all other parameters

Follow the procedure described in **A** and **B** and

- F) Push and release to display the actual value of the selected parameter.
- G) Push or within 4 seconds since the pressure on to modify its value.
- H) After the modify push and release or wait 4 seconds without operate on the keys (time-out exit).

How to leave the programming procedure

- Keep pushed and at the same time for 4 seconds at least or wait 50 seconds without operate on the keys (time-out exit).

CONFIGURATION PARAMETERS

CODE	PARAMETER	DESCRIPTION	MIN.	MAX.	U.M.	ST.
t 0	"Status 1" and "Status 3" time base	0=sec.:ten.; 1=min.:sec.; 2=hours:min.	0	2	----	0
t 1	E 1 switching mode	0=rising (N.C. cont.); 1=falling (N.O. cont.)	0	1	----	0
t 2	E 2 switching mode	0=rising (N.C. cont.); 1=falling (N.O. cont.)	0	1	----	0
t 3	signalling buzzer functioning during the "Status 4"	0=excluded; 1=continuous; 2=intermittent	0	2	----	0
t 4	modality of "Start" input enabling	0=UP or E 1; 1=UP; 2=E 1	0	2	----	0
t 5	modality of "Stop" input enabling	0=DOWN or E 1; 1=DOWN; 2=E 1	0	2	----	0
t 6	count mode	0=countdown; 1=count up	0	1	----	0
t 7	count continuation function	0=NO; 1=YES	0	1	----	0
(1) t 8	count holding		0	2	----	0
t10	"Status 2" time base	0=sec.:ten.; 1=min.:sec.; 2=hours:min.	0	2	----	0
t11	"Status 1" length		see TABLE 1			0
t12	output 1 activated ON or OFF	0=ON; 1=OFF	0	1	----	0
t20	"Status 3" length		see TABLE 1			0
t21	output 2 activated ON or OFF	0=ON; 1=OFF	0	1	----	0
(2) t22	end of "Status 4" modality		0	2	----	0
t23	"Status 4" time base	0=sec.:ten.; 1=min.:sec.; 2=hours:min.	0	2	----	0
t24	"Status 4" length		see TABLE 1			0
t25	outputs configuration		see TABLE 2			0
t31	count showing during the "Status 1"	0=NO; 1=YES	0	1	----	0
t32	count showing during the "Status 2"	0=NO; 1=YES	0	1	----	1
t33	count showing during the "Status 3"	0=NO; 1=YES	0	1	----	0
t34	count showing during the "Status 4"	0=NO; 1=YES	0	1	----	0
L	NETWORK CONNECTION					
L1	instrument address		1	15	----	1
L2	instrument group		0	7	----	0

NOTES

- (1) = see "Count holding" function.
- (2) = the "Status 4" can end according to one of the following modality:
- for a "Stop" input ("t22"=0)
 - for a "Start" or "Stop" input ("t22"=1)
 - for a "Stop" input or at the end of the established time ("t22"=2).

TABLE 1

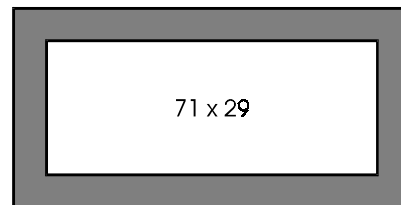
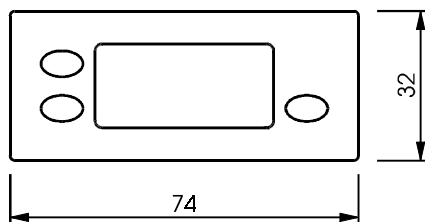
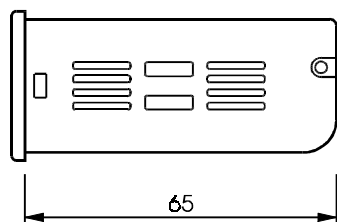
"Status ... " time base	range of timer setting	
	resolution	display end of scale
seconds:tenths	00:10	99:90
minutes:seconds	00:01	99:59
hours:minutes	00:01	99:59

TABLE 2

parameter "t25"	K 1 linked to	K 2 linked to	Notes
0	output 1	output 2	-
1	output 1	output 1	K 2=K 1
2	output 2	output 2	K 1=K 2

SIZE AND PIERCING TEMPLATE

Measures in mm.

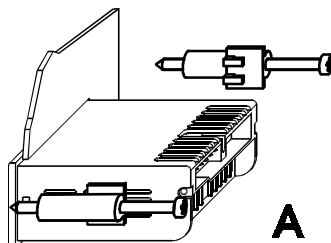


OPTIONS OF MOUNTING

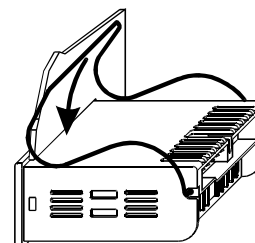
With:

- screw brackets (A) or
- spring bracket (B).

The panel thickness will be between 1 and 5 mm.



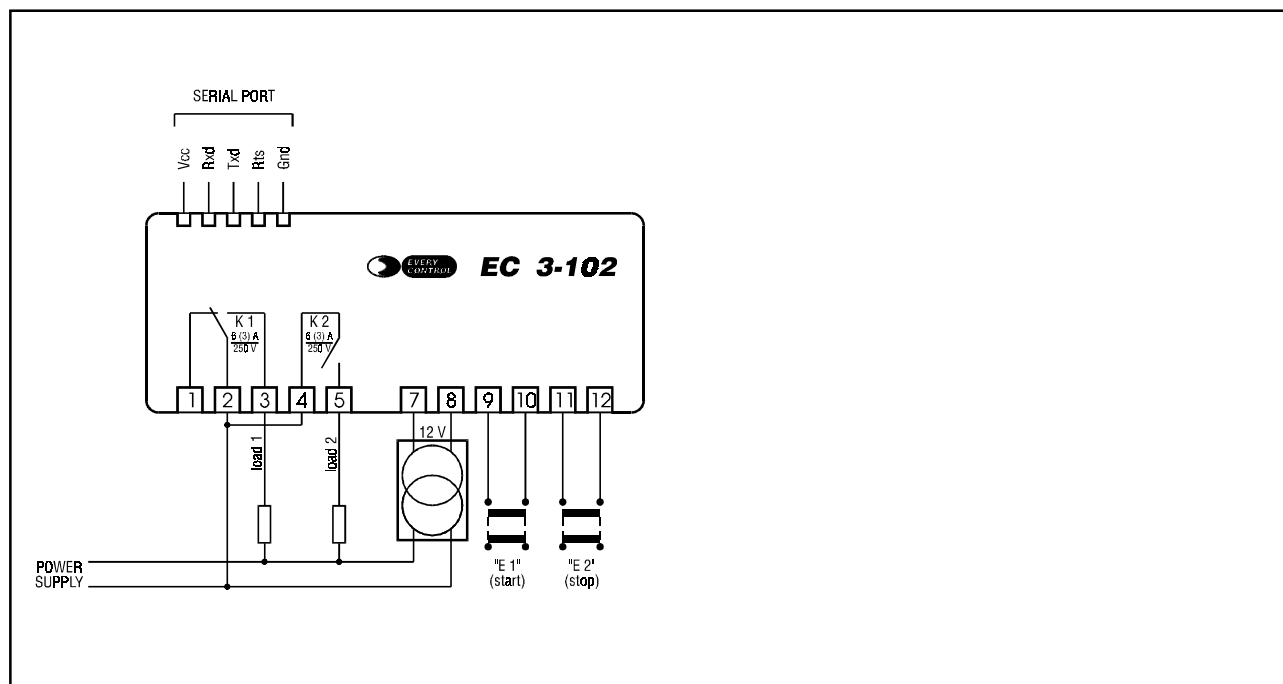
A



B

ELECTRICAL CONNECTIONS

Example of typical application.



ELECTROMECHANICAL CHARACTERISTICS

Box:	plastic (PC-ABS) black, self-extinguish according to UL94 V-0.
Size:	74 x 32 x 65 mm.
Mounting:	panel mounting with screw or spring brackets.
Environment	
temperature:	from 0 to +60 °C.
Humidity:	10 ... 90% not condensing.
Connections:	through screw connector.
Power supply:	12 Vac/dc (standard) or 12-24 Vac/dc (on request) 50-60 Hz 1,5 VA.
Insulation class:	II (with transformer according to EN 60742).
Remote inputs:	2 (5 V, 1 mA), with configurable switching mode, for to start (E 1) and to stop (E 2) a cycle of counting.
Range of measure:	from 1/10 sec. to 99 h. 59 min.
Range of timer setting:	from 0 to 99 h. 59 min.
Display:	4 digits display, K 1 output status indicator.

Resolution:	1/10 sec. with seconds:tenths time base 1 sec. with minutes:seconds time base 1 min. with hours:minutes time base.
Signalling buzzer:	included.
Outputs:	one SPDT 6 A at 250 Vac relay (K 1), one SPST 6 A at 250 Vac relay (K 2).
Serial port for data exchange:	TTL with EVCBUS protocol (standard).