F&F Filipowski sp. j.
Konstantynowska 79/81 95-200 Pabianice
phone/fax: (+48 42) 215 23 83 / 227 09 71 POLAND
http://www.fif.com.pl e-mail: biuro@fif.com.pl

PROGRAMMABLE CONTROL TIMER with 0÷10 V analogue output

PCZ-531A10

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Do not dispose of this device in the trash along with other waste! According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that end point of collection, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.

PURPOSE

The PCZ-531A10 is designed for programmable, temporary control of devices with the standard voltage signal 0÷10 V.

FUNCTIONING

The timer sets the brightness of the output circuit to the preset level (range 0-100%) on the preprogrammed hours in daily, weekly, business days (Mo.-Fr.) or weekend (Sa.-Su.) cycles. It is possible to program up to 480 independent program steps. The controller is equipped with a local input allowing remote control of the controller with any monostable button and with an auxiliary relay that activates when the output is switched on (set brightness level higher than zero).

TIMER FEATURES

AUTOMATIC OPERATION - operation by ON-OFF COMMANDS programmed by the user in the timer memory [icon on display is switched on]
MANUAL OPERATION - manual control (with the button connected to the controller) over the switching-on, switching-off and level of brightness
SEMI-AUTOMATIC OPERATION - operation in automatic mode can be interrupted to manually (with external button) set the brightness level. Semi-automatic operation continues until manual return to the automatic mode or until the next step of the program is started.
ON-OFF COMMAND - program entry according to which the receiver will be turned on or off.
OPERATION CYCLE - adjustable, weekly cycle of the receiver switching in accordance with the programmed commands:
* single day of the week: Mo. Tu. We. Th. Fr. Sa. or Su.
* business days: Mo. Tu. We. Th. Fr. (Monday to Friday).
* weekend: Sa. Su. (Saturday and Sunday)
* daily: Mo. Tu. We. Th. Fr. Sa. Su. (Monday to Sunday).

AUTOMATIC TIME CHANGE - Changing time from winter to summer is automatically done at night on the last Saturday/Sunday of March. Changing time from summer to winter is done on the last Saturday/Sunday of October. The controller has a time zone selection feature, so that the switching time is consistent with local time.
DATE PREVIEW - Pressing the OK button displays the set date in the format: dd-mm-yy.
CURRENT PROGRAM PREVIEW - If the timer operates in automatic mode, then the subsequent pressing of the Up/Down button in the date preview mode will display information about the number and details of the currently running program.
CLOCK FREQUENCY ADJUSTMENT - Ability to freely accelerate/decelerate the timer. For example, if the controller starts to run slow 5 seconds per month over time, you can programmatically correct the deviation.
REPLACEABLE BATTERY (type 2032) - The controller is provided with a battery status monitor in case of a main power failure. If the battery is low, you will be informed that you need to replace it.
LCD BRIGHTNESS ADJUSTMENT - Changing the display contrast allows you to obtain clear LCD reading for different viewing angles.
RELAY STATE MEMORY - The set state of the relay in manual mode is saved also after power failure.

DISPLAY AND CONTROL PANEL DESCRIPTION

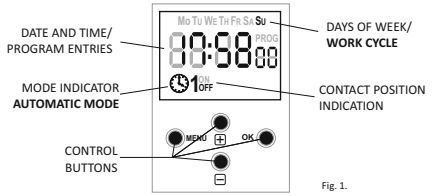

Fig. 1.

Mo – Monday; Tu – Tuesday; We – Wednesday; Th – Thursday; Fr – Friday; Sa – Saturday; Su – Sunday.

WORK MODE SIGNALLING

1OFF	Auto mode - light off
1ON	Auto mode - light on (brightness level >0)
1OFF	Manual mode - light off
1ON	Manual mode - light on
1OFF	Semi-automatic mode - light off
1ON	Semi-automatic mode - light on

OPERATING MODE INDICATION

MENU:
Pressing this button opens up the controller configuration mode. In edit mode, pressing MENU will exit the edited parameter (without saving the changes) and return to the parent menu level.
OK
In edit mode, pressing the button opens up edition of the next setting item. If you edit the last position, pressing the OK button will save the new parameter value, exit the edit mode and go to the parent menu level.
In the time display mode, pressing the OK button will display the date and numbers of the currently running programs (if the timer is in automatic mode) - switching between values is done by pressing the "+" or "-" buttons.
+ (plus)
In edit mode, pressing the button increases the value of the parameter to be edited by 1. If the button is pressed for a long time, the value of the parameter will be cyclically increased by 1.
In manual mode (except editing), pressing the button increases the brightness level. The set value is indicated on the display.

Fig. 2.
Setting the brightness level

- [minus]
In edit mode, pressing the button decreases the value of the parameter to be edited by 1. If the button is pressed for a long time, the value of the parameter will be cyclically decreased by 1.
In manual mode (except editing), pressing the button decreases the brightness level. The set value is indicated on the display.

CONTROL INPUT

The PCZ-531 has a control input for connecting an external monostable button. This button can be used for additional control over the controller operation and lighting level.

Operating mode	Action description
Manual	Short press of the button turns off the light when it was turned on (brightness level > 0) or turns on to the last set level when it was off (brightness level =0). Long press of the button brightens/dims the light.
Automatic	Pressing the button switches the controller to operate in semi-automatic mode.
Semi-automatic	After short press of the button the controller returns to automatic mode of operation. Long press brightens or dims the light.

The basic operating mode of the display is to indicate the current time, day of the week, operating mode (automatic or manual) and relay status (ON or OFF). The example of this display is shown below (Fig. 2)

Fig. 2.
Display overview

Pressing the OK button at this point will display the current date (Fig. 3).

Fig. 3.
Setting the current date

If the clock is in automatic mode, you can press the "+" or "-" buttons to display the number of the currently running program when the current date is displayed (Fig. 4).

Fig. 4.
Number of the currently running program

Pressing the OK button while displaying the current program number will display the program details (Fig. 5 and Fig. 6).

Fig. 5.
Program start time

Fig. 6.
Set brightness level

Warning!
A delay may occur between the time the new program is written to the timer and the moment it is executes. The maximum time for this delay is two minutes and the wrong number of the current program may be indicated during this time.

INFORMATION MESSAGES

In special cases, the display of the current time and the state of the timer may be interrupted by information messages:

Low	The **Low batt** message indicates the battery level is too low to maintain the timer operation after power failure. In this case, it is recommended to replace the battery. Low battery level is not an obstacle during normal timer operation. However in the case of a power failure it may result in loss of date and time settings.
bAtt	**Warning!** All settings, except for time and date, are saved in non-volatile memory and are not lost in case of power failure and too low battery level.
Err	Internal PCZ timer error indication. The fault may be caused by an external interference or configuration error, or it may indicate the damage to the controller. The instructions below explain how to clear the error messages. If they are repeated, contact the customer service.

SETTINGS

To enter the setup mode, press the MENU button. This will display a main menu that consists of the following items:

dAtE	Date configuration
Hour	Time configuration
Prog	Add new programs
Edit	Edit existing programs
dEL	Delete programs
mode	Select the operating mode of the controller
SySt	Edit system parameters

One menu item is displayed at the same time.
Moving between menu items is done by pressing the "+" and "-" buttons. Press the OK button to enter the selected menu item. To exit the menu mode, press the MENU button.

DATE EDIT

To change date:

Warning!
The currently edited value is indicated by blinking of the parameter digits.
In the following example it is indicated by a gray color.

1	17:58 00 1OFF	Press the **Menu** button and then use the **Up** or **Down** buttons to display the **Date** menu.	dAtE
2	dAtE	Press the **OK** button to enter date edit mode. Digits in year position will start to blink.	15 06 13
3	15 06 13	Using the **Up** and **Down** buttons set the correct year.	Su 15 06 14
4	Su 15 06 14	Press the **OK** button to confirm year and proceed to the month configuration.	Su 15 06 14

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5		Use the **Up** and **Down** buttons to set the correct month	
6		Pressing the **OK** button confirms the month and proceeds to edit the day.	
7		Use the **Up** and **Down** buttons to set the correct day	
8		Pressing the **OK** button confirms the new date and returns to the **Date** menu. **Warning!** The day of the week is updated on a regular basis during the change of years, months, and days	

TIME EDIT

To change the current time:

Warning!

The currently edited value is indicated by blinking of the parameter digits.
In the following example it is indicated by a gray color.

1		Press the **Menu** button and then use the **Up** or **Down** buttons to display the **Hour** menu.	
2		Press the **OK** button to enter time edit mode. Digits in hour position will start to blink	
3		Using the **Up** and **Down** buttons set the correct hour	
4		Press the **OK** button to confirm new hour and proceed to the minute configuration	
5		Use the **Up** and **Down** buttons to set the correct minute.	
6		Pressing the **OK** button confirms the new date and returns to the **Hour** menu. **Warning!** The second counter starts counting from zero at the moment the **OK** button is pressed to confirm new time.	

ADD PROGRAMS

To add a new controller operating program:

Warning!

The currently edited value is indicated by blinking of the parameter digits.
In the following example it is indicated by a gray color.

1		Press the **Menu** button and then use the **Prog.** buttons.	

2		Press the **OK** button to move to the first free program. **Warning!** If necessary, you can change the free program number using the **Up/Down** buttons. **Warning!** In cases where a large number of steps is defined, delays may occur (up to 2÷3 s) before the free program number is displayed.	
3		Pressing the **OK** button confirms the number of the new program and changes to the day/days editing mode in which the program will run.	
4		Use the **Up** and **Down** buttons to select the day or days in which the program will be executed. It is possible to set: every day of the week, business days (Mo. - Fr.), weekends (Sa. - Su.) or the entire week.	
5		Use the **OK** button to confirm the cycle days and move to edit the time the program runs.	
6		Use the **Up** or **Down** buttons to set the start time of the program.	
7		Pressing the **OK** button confirms the time and moves to the minute the program is executed.	
8		Use the **Up** or **Down** button to set the minute the program is going to run.	
9		The **OK** button confirms the minute and moves to setting the brightness level for the given step.	
10		Use the **Up** and **Down** buttons to set a percentage value of the brightness level. Full light off corresponds to 0% level.	
11		Pressing the **OK** button confirms the new program and moves to the menu that allows you to add another program.	

Warning!

Programs in the controller are executed cyclically and in the order they are stored in memory (program number is determining). If you enter two (or more) programs that start at the same time, then the first one (with lower number) will be executed.

EDIT PROGRAM

Editing allows you to change the parameters of the programs entered into the controller memory.

Warning!

The currently edited value is indicated by blinking of the parameter digits.
In the following example it is indicated by a gray color.

1		Press the **Menu** button and then use the **Up** or **Down** button to display the **Edit** menu.	
2		Pressing the **OK** button will display the first number stored in the program memory.	
3		Use the **Up** or **Down** buttons to select the program number you want to edit. **Warning!** In cases where a large number of steps is defined, delays (up to 2-3 seconds) may occur before the number of the next program is displayed	
4		In the next steps we can change the settings of the selected program - in the same way as adding a new program (steps 4-10).	

DELETE PROGRAM

The **del** command completely removes the selected program from the memory of the controller.

Warning!

If you need to quickly remove all program entries, it is recommended to use the **CLEAR -> PROG** command in the **System** menu.

1		Press the **Menu** button and then use the **Up** or **Down** button to display the **del** menu.	
2		Use the **Up** or **Down** buttons to select the program number you want to delete. **Warning!** In cases where a large number of steps is defined, delays may occur (up to 2÷3 seconds) before the program number is displayed.	
3		Pressing the **OK** button enters standby mode for confirmation of program deletion. In this mode, the program number and its details are alternately displayed.	
4	 	To delete the selected program, press and hold down the **OK** button until the number of the program being erased disappears and the number of the next program is displayed.	

MODE - OPERATING MODE

The **Mode** menu allows you to select whether the controller is operating in automatic mode (auto) by processing and executing defined program steps, or in manual mode (hand), maintaining the state of the relay forced by the user.

1		Press the **Menu** button and then use the **Up** or **Down** buttons to display the **Mode** menu.	
2		When you press the **OK** button, the currently set operating mode is displayed	
3		Use the **Up** or **Down** buttons to set the desired operating mode.	
4		Confirm your selection by pressing the **OK** button. The parameter is stored in memory and the **Mode** menu is displayed.	

SYSTEM SETTINGS

1		Press the **Menu** button and then use the **Up** or **Down** buttons to display the **Syst** menu.
2		Use the **Up** or **Down** button to select the submenu and confirm by pressing the **OK** button. The following settings are available:
3		Setting the brightening and dimming time.
4		Adjust the brightness characteristics.
5		**DST** mode allows you to automatically change the time between summer and winter and winter and summer. **Warning!** Time change function works correctly in countries where time change occurs on the last Saturday or Sunday in March and the last Saturday or Sunday in October. **Warning!** For the change to occur at the correct time, the UTC time zone must be correctly set.
6		The **UTC** parameter specifies the time zone in which the timer works. Correct parameter setting is necessary to change the summer <-> winter at the correct time.
7		Indicator informing about the state of the internal battery used to support the timer operation in case of power failure.
8		The **CAL** parameter allows you to manually adjust the timer speed when deviations are detected in the accuracy of time measurement.

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9	LCd	Correction of the display contrast allows you to adjust the display of the digits to the user's expectations and the assumed angle of view of the display.
10	CLEAr	Menu for quick erasing of controller parameters and program entries.
11	inFo	Info - information about device type and software version.

DELTA Menu

1	SySt	Use the **Up** or **Down** buttons to display the Delta menu. When you press **OK**, the currently set brightening/dimming time is displayed.	dELtA
2	dELtA	**Warning!** The time set here shows how long the brightening or dimming will last for a full brightness change (0%→100% or 100%→ 0%). Lesser brightness change will be shorter in proportion.	01.0
3	01.0	Use the **Up** or **Down** button to set the desired brightening and dimming time. The setting range is 0.0 to 99.9 s (the small digit on the display shows the tenths of a second).	99.9
4	99.9	After setting the value, press the OK button to confirm and exit the editing mode.	dELtA

DST Menu

1	SySt	Use the **Up** or **Down** buttons to display the **DST** menu.	dSt
2	dSt	When you press the **OK** button, the current setting value will be displayed. The **Auto** value means that the controller automatically adjusts the hour at the time of the transition from summer to winter (and vice versa) time zone. The **Off** value means the controller will not automatically change the hour.	Auto
3	Auto	Use the **Up** or **Down** button to select the appropriate parameter value.	OFF
4	OFF	Confirm selection by pressing the **OK** button.	dSt

UTC Menu - time zone selection

1	SySt	Use the **Up** or **Down** buttons to display the **UTC** menu.	utC
2	utC	When you press the **OK** button, the current setting value will be displayed.	utC 1
3	utC 1	Use the **Up** or **Down** buttons to enter the correct time zone in which the clock operates.	utC -2
4	utC -2	Confirm the setting by pressing the **OK** button.	utC

Batt - battery charge indicator

1	SySt	Use the **Up** or **Down** buttons to display the **Batt** menu. bAtt
2	bAtt	When you press the **OK** button, one of the following four battery status messages will be displayed.
3	HiGH	**High** - fully charged, new battery.
4	Good	**Good** - Battery in good condition, ensuring long-term correct operation.
5	Low	**Low** - Low battery charge. It is recommended to replace the battery as soon as possible.
6	EmPty	**Empty** - Battery discharged - needs immediate replacement.

TIMER FREQUENCY CALIBRATION

In case the clock starts to run fast or slow (which is possible due to quartz aging), the user can enter a corresponding adjustment counted as the number of seconds per month.
The adjustment range is +/- 300 seconds per month.

Example

If the clock runs fast by four seconds per month then the CAL parameter should be set to -4.

1	SySt	Use the **Up** or **Down** buttons to display the **CAL** menu.	CAL
2	CAL	When you press the **OK** button, the current setting value will be displayed.	CAL 0
3	CAL 0	Use the **Up** or **Down** buttons to set a new parameter value.	CAL -4
4	CAL -4	Confirm the change by pressing the **OK** button.	CAL

LCD Menu

Change the contrast of the display.
Adjustable range from -3 (smallest contrast) to +3 (highest contrast).
Here's an example of reducing the contrast from level 0 to level -3.
Changes are visible immediately on the displayed characters.

1	SySt	Use the **Up** or **Down** buttons to display the **LCD** menu.	LCd
2	LCd	When you press the **OK** button, the current setting value will be displayed.	LCd 0
3	LCd 0	Use the **Up** or **Down** buttons to set a desired parameter value.	LCd -3
4	LCd -3	Confirm the change by pressing the **OK** button.	LCd

Clear Menu

The Clear menu consists of two commands:
Clear Prog - clear all program entries.

1	SySt	Use the **Up** or **Down** buttons to display the **CAL** menu.	CLEAr
2	CLEAr	Press the **OK** button to enter **Clear Prog** mode.	PrOG
3	PrOG	Press the **OK** button to enter standby mode to clear the program entries. This is signaled by alternate displaying of signs.	CLEAr / PrOG
4	CLEAr / PrOG	To confirm deletion press and hold the **OK** button until the number of consecutive deleted entries appears on the display.	CLr 1 / CLrSOO
5	Once cleared, the controller returns to the **Clear Prog** menu.		PrOG

Clear Sys - Clears system settings to default values: DST mode, time zone, operating mode and relay settings, timer calibration, contrast settings. Time and date settings are not deleted.

1	SySt	Use the **Up** or **Down** buttons to display the **Clear** menu.	CLEAr
2	CLEAr	Press the **OK** button to enter **Clear Sys** mode.	SYS
3	SYS	Press the OK button to enter standby mode to confirm the clearing of system parameters. This is signaled by alternate displaying of texts.	CLEAr / SYS
4	CLEAr / SYS	To confirm the deletion, press and hold the **OK** button until the **Clear Sys** menu appears on the display.	SYS

Clear Error

If a controller error is detected and indicated by displaying Error messages, it will be possible to delete the error flag. When there are no errors, this option will not be displayed.

Warning!

If the errors repeat, please contact the customer service.

1	SySt	Use the **Up** or **Down** buttons to display the **Clear** menu.	CLEAr
2	CLEAr	Press the **OK** button to enter **Clear Error** mode.	Error
3	SYS	Press the **OK** button to enter standby mode to confirm the clearing of system parameters. This is signaled by alternate displaying of texts.	CLEAr / Error

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4		To confirm the deletion, press and hold the **OK** button until the **Clear Error** menu appears on the display.	

Info

The device type and firmware version information are displayed here.

1		Use the **Up** or **Down** buttons to display the **Info** menu.	
2		When you press the **OK** button, the text with the device name is displayed.	
3		When you press the **Up** or **Down** button, the software version information is displayed.	

BATTERY CHANGE

You can replace the battery yourself. Detailed picture and video instructions can be found at www.fif.com.pl on the timer page.
Battery Type: 2032 (lithium).

TECHNICAL DATA

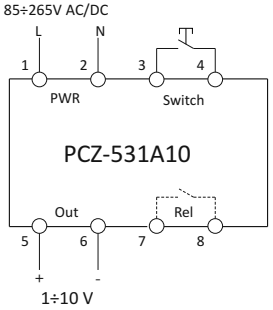
power supply	85÷265V AC/DC
analog output	1÷10V/30mA
contact	separated 1×NO / 6A 250V AC
input	potential-free (triggered by closing of contacts 3-4)
timer operation support time	6 years*
battery type	2032 (lithium)
backup time display operation	none
accuracy of the clock	1sec
time error	±1s/24h
time program setting accuracy	1min.
number of memory cells	480
power consumption	<1.5W
working temperature (vapour non-condensing)	-15÷50°C
terminal	2.5mm² screw terminals
tightening torque	0.4Nm
dimensions	2 modules (35mm)
mounting	on TH-35 rail
protection level	IP20

* battery life addicted to weather coditions and frequency of mains failure

ASSEMBLY

1. Turn off the power.
2. Mount the timer on the TH rail in the distribution box.
3. Connect wires according to the diagram.
4. Connect receivers according to the diagram.
5. Set the correct date and time.
6. Set individual time program for receiver switching on.

CONNECTION DESCRIPTION



1-2 85÷265V AC/DC power supply
3-4 button
5-6 analog signal output
7-8 auxiliary relay contact

CONNECTION SCHEME