



TECHNICAL MANUAL

Astro
digital timer
TM-AS



1 DESCRIPTION

Astro digital timer TM-AS is used for automatic control of lighting (or other electrical equipment) using two independent groups of contacts with no light sensors with controlled switching by sunset and sunrise time based on location coordinates.

The product corresponds to GOST IEC 60947-1-2014, GOST IEC 60947-5-1-2014.

2 TECHNICAL DATA

Table 1.

Parameter		Value	
Артикул		tm-as	tm-as-1
Rated supply voltage (Un), V		AC/DC 24-264	230 AC
Rated frequency, Hz		50/60	
Insulation voltage, Ui, V		250	
Maximum switching current of contacts, A	at $\cos\varphi = 1$	16	
	at $\cos\varphi = 0,7$	10	
Maximum number of programmes		80	52
Utilization category		AC1	
Type and number of contacts		2 C/O	1 C/O
Maximum switching power		4000 BA/AC1; 384 BT/DC	
Error of time counting, s/day, not more		±1	
Battery life, years, not less		10	
Power consumption, VA, max.		2	1
Electrical endurance, cycles		100 000	
Mechanical endurance, cycles		1 000 000	
Maximum cross-section of connected wires, mm ²		4	
Tightening torque, N·m		0,5	

Parameter	Value
Degree of protection	IP20
Weight, g, max.	200
Operating temperatures	-20...+55°C
Climatic version	NF4
Altitude above sea level, m, max.	2000
Permissible relative humidity at 40°C (non-condensing), not more	50%
Degree of pollution	3
Position in space	Any
Installation	Onto 35 mm DIN rail

The product shall be operated under the following environmental conditions:

- non explosive;
- no aggressive gases and vapors in concentration that can destroy materials and insulation;
- not saturated with current conducting dust and vapors;
- no direct UV rays impact (for relay).

Housing is made of ABC flame retardant plastic.

There are setup buttons for current time and timer programming, LED illuminated display on the front panel of the timer under transparent cover with possible sealing.

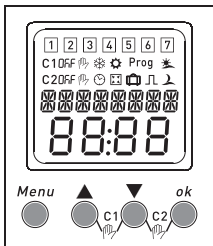


Figure 1. Front panel.

Display indicators:

1 2 3 4 5 6 7 - Weekdays:

Monday... sunday

C1 - Channel №1 setting up

C2 - Channel №2 setting up

0n OFF - Contact position

☀ - Automatic mode

☾ - Manual mode

🏠 - Holiday mode

❄ - Winter time

☀ - Summer time

Prog - Program configuration







🎲 - Random mode

☀ - Sunrise

☾ - Sunset

Function of control buttons:

Table 2

	<ul style="list-style-type: none"> • Menu entry • Return to the main menu 		<ul style="list-style-type: none"> • Confirm the selection
	<ul style="list-style-type: none"> • Selection in the menu • Value increase 		<ul style="list-style-type: none"> • Selection in the menu • Value decrease
	<ul style="list-style-type: none"> • Manual control 		<ul style="list-style-type: none"> • Manual control

Built-in lithium battery ensures that the timer program will last for 10 years in the event of power failure.

The timer microprocessor ensures the execution of a control program with a number of programs up to 80 by two independent channels (two groups of switching contacts). In this mode, the timer will be turned on and turned off according to the configured program.

If necessary, the timer can be put to the «Holiday» mode, during which the configured program will not run. With that, the program will be saved, the C/O contacts will be constantly in the initial state: 15-16, 25-26 – closed; 15-18, 25-28 – open.

The timer has also a manual mode, where the output state of the contacts is set manually.

In random mode the timer will automatically trigger in the range from 1 to 30 minutes.

3 INSTALLATION AND OPERATION

The product shall be installed onto 35 mm DIN rail in the distribution enclosure.

In order to avoid pickup, false triggering, improper operation of the timer, don't put the supply conductors together with power wiring. Use the shielded cable if necessary.

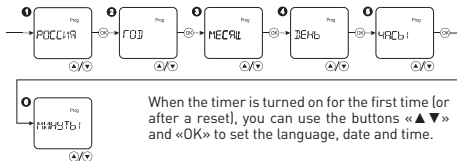
Copper and aluminum wire with cross-section of max. 4 mm² connections are supported. Before connection of stranded conductors, terminate them with a lug or sleeve using an appropriate tool.

The mounted-in lithium battery will be fully charged during 24 hours from the moment when the timer is switched on.

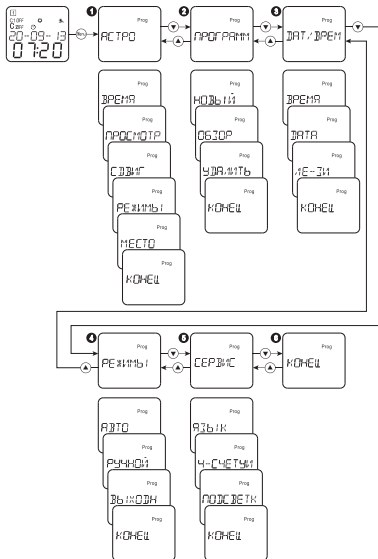
Connect power conductors to timer terminals L and N. The normally open output contacts of the timer (terminals 18, 28 - normally open; 16, 26 - normally closed; 15, 25 - common) are connected in the break in the phase wire of the power supply of the two load groups or in the break in the power supply wire of the executive element of the switching device, such as the control coil for contactor.

3.1 SETTINGS AND PROGRAMMING

Initial settings:



Main menu:



1	Astro	Astro mode setting
2	PROGRAMM	Programming mode
3	DATE/TIME	Date and time settings
4	MODES	Mode settings
5	SERVICE	Other settings
6	END	End of settings and exit from the menu

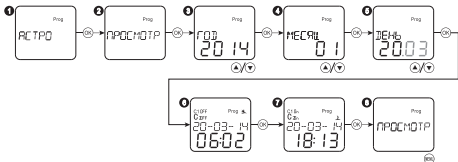
Press «MENU» to enter the main menu. With the buttons «▲▼» select the desired menu item. If there is no activation for one minute, the timer will exit automatically from the menu.

Astro mode setting: View the sunrise/sunset time:

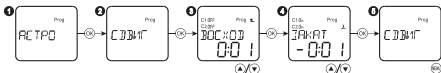


Select the mode ASTRO, press «OK». Then select the menu item TIME and press «OK». After that you can view sunrise/sunset time and press the button «OK». Press the button «MENU» to return to the main menu.

In order to view the astronomical time on a specified day:



Select the mode **ASTRO** and press «OK». Then select the menu item **VIEW** and press «OK». Select the year with the buttons «▲▼» and press «OK». Select the desired month and day in the same way. If you press the buttons «▲▼» for a long time (more than 0,5 s), the values will be changed quicker. After that press the button «OK» sequentially to view the sunrise/sunset time on a specified time. Press the button «OK» to return to the main menu.



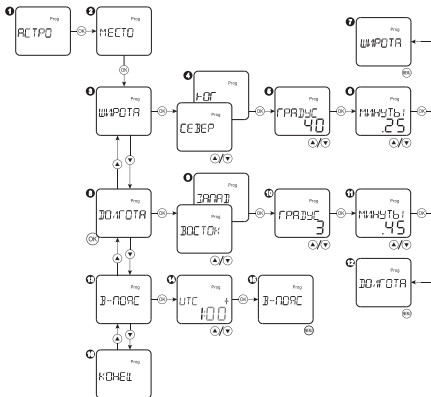
Select the mode **ASTRO** and press «OK». Select the menu item **OFFSET** and press OK. Select the sunrise offset time with the buttons «▲▼» and press OK. Select the sunset offset time in the same way. If you press the buttons «▲▼» for a long time (more than 0,5 s), the values will be changed quicker. Range of time offset is ± 2 h. Press the button **MENU** to return to the main menu.

Astronomical mode setting up:



Select the mode ASTRO and press OK. Then select the menu item MODE and press OK. Select channel 1 or 2 with the buttons «▲▼» and press OK. Select channel 1 or 2 with the buttons «▲▼» and press OK. Select ON or OFF to activate or deactivate the astronomical mode and press OK. Press MENU to return to the main menu.

Geographical location setting up:



Select the mode ASTRO and press OK. Then select the menu item LOCATION and press OK. Select the menu item LATITUDE and press OK to set up the latitude. Then select the southward or northward, set up the degrees and minutes with the buttons «▲▼». Press OK to confirm. Set up the longitude in the same way. Menu item - LONGITUDE. The time zone can be also set up. Select the menu item TIME ZONE and set up the time zone within ± 12 . Press MENU to return to the main menu.

Time zone map of Russia and the countries of the former USSR

The numbers indicate the difference against the Universal Time



City	Latitude, degrees N.	Longitude, degrees E.	City	Latitude, degrees N.	Longitude, degrees E.
Arkhangelsk	65	41	Novokuznetsk	54	87
Astrakhan	46	48	Novosibirsk	55	83
Barnaul	53	83	Omsk	55	73
Belgorod	51	37	Orenburg	52	55
Blagoveshchensk	50	128	Penza	53	45
Bryansk	53	34	Perm	58	56
Vladivostok	43	132	Petropavlovsk-Kamchatski	53	159
Vladimir	56	40	Rostov-on-Don	47	40
Volgograd	49	44	Ryazan	55	40

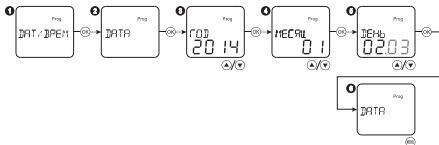
City	Latitude, degrees N.	Longitude, degrees E.	City	Latitude, degrees N.	Longitude, degrees E.
Voronezh	52	39	Samara	53	50
Yekaterinburg	57	61	St. Petersburg	60	30
Ivanovo	57	41	Saratov	52	46
Izhevsk	57	53	Severo-Kurilsk	51	156
Irkutsk	52	104	Sochi	44	40
Kazan	56	49	Stavropol	45	42
Kaliningrad	55	21	Tver	57	36
Kaluga	55	36	Tolyatti	53	49
Kemerovo	55	86	Tomsk	56	85
Kirov	59	50	Tula	54	38
Krasnodar	45	39	Tyumen	57	66
Krasnoyarsk	56	93	Ulan-Ude	52	108
Kursk	52	36	Ulyanovsk	54	48
Lipetsk	53	40	Ufa	55	56
Magadan	60	151	Khabarovsk	48	135
Magnitogorsk	53	59	Cheboksary	56	47
Makhachkala	43	47	Chelyabinsk	55	61
Moscow	56	38	Chita	52	114
Naberezhnye Chelny	56	52	Yuzhno-Sakhalinsk	47	143
Nizhniy Novgorod	56	44	Yakutsk	62	130
Nizhni Tagil	58	60	Yaroslavl	58	40

Current time setting:



Select the menu item DATE/TIME, press the button OK. Then select the menu item TIME, press OK. Set up the current hour and minute with the buttons with «▲▼», moving to the relative item with the button OK. If you press the buttons «▲▼» for a long time (more than 0,5 s), the values will be changed quicker. Press MENU to exit from the settings.

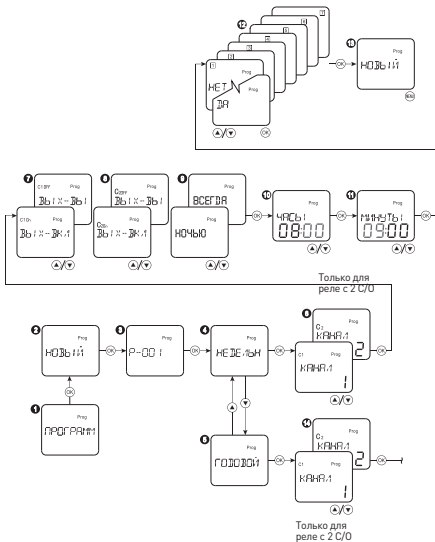
Current date setting:

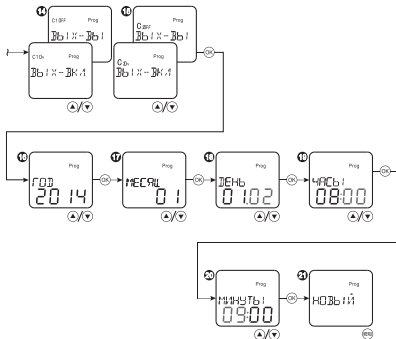


Select the menu item DATE/TIME, press the button OK. Then select the menu item TIME, press OK. Set up the current year, month, day with the buttons «▲▼», moving to the relative item with the button OK. If you press the buttons «▲▼» for a long time (more than 0,5 s), the values will be changed quicker. Press MENU to exit from the settings.

Display	Summer time	Winter time
Summer time EUROPE	Last Sunday in March	Last Sunday in October
Summer time USA	Second Sunday in March	First Sunday in November
PROGRAMMS	Free programming	Free programming
OFF	No	No

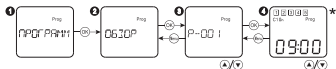
New program configuration:





Select the menu item PROGRAM, press the button OK. Select the item NEW, press the button OK. After that the number of the program will be displayed. If the memory of the timer is full, a new program will not be configured. FULL will be displayed. Set up the weekly WEEK or yearly YEARLY operation cycle of the timer. Then set the position of output contacts. Then select the night mode NIGHT (the relay will be activated only when the ON/OFF time is between sunset and sunrise with regard to offsets) or ALWAYS. Then set hours and minutes for a weekly cycle; year, month, day and time for a yearly cycle to activate the program for each channel. Press the button OK. If required, add an additional program step, press OK and repeat programming. Press MENU to complete programming.

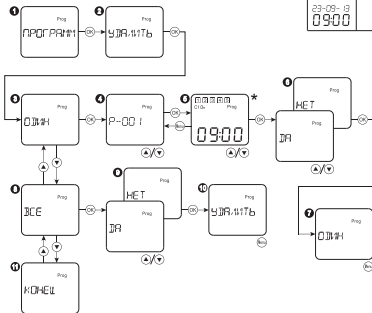
Adjustment of configured program:



Select the menu item PROGRAM, press the button OK. Select the menu item REVIEW, press the button OK and repeat the actions described in the previous item.

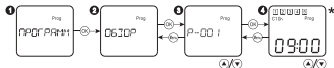
Delete a program:

* 09:00	Weekly program
23-09-13	Yearly program
09:00	



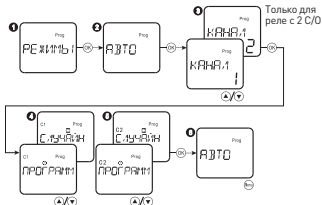
Select the menu item PROGRAM, press the button OK. Select the menu item DELETE, press the button OK. If required to delete one program, select the item ONE, then select the number of the deleted program with the buttons «▲▼» and press OK. If required to delete all the programs, select the item ALL and press the button OK to confirm the memory cleaning.

Review of configured programs:



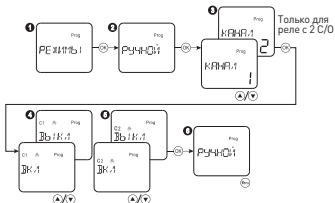
Select the menu item PROGRAM, press the button OK. Select the menu item REVIEW, press the button OK. After that you can review all the configured programs with the buttons «▲▼».

Random operating mode setting up:



Select the menu item MODES, press the button OK. Select the menu AUTO, press the button OK. Select the channel and then select the operating mode of the timer: automatic- as per configured program, or random – a random activation of the time is within 1 to 30 minutes. Press MENU to complete program configuration.

Manual mode:



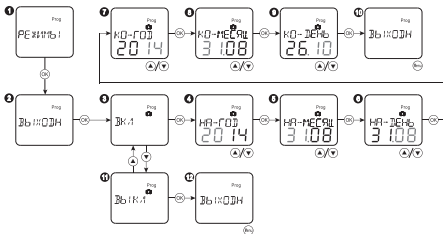
Select the menu item MODES, press the button OK. Select the item MANUAL, press the button OK. Select the channel, set the position of the ON or OFF contacts. Press MENU to complete program configuration.

Ручное управление



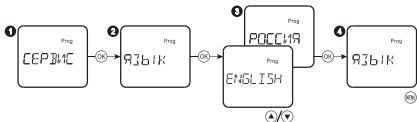
When the buttons «▲▼» will be pressed at the same time, the output contacts 18-15 of channel K1 will be constantly closed. When the buttons «▲▼» will be pressed again at the same time, the timer will be returned to the automatic mode. When the buttons «▼» and «OK» will be pressed at the same time, the output contacts 28-25 of channel K2 will be constantly closed. When the buttons «▼» and «OK» will be pressed again at the same time, the timer will be returned to the automatic mode.

HOLIDAY mode settings:

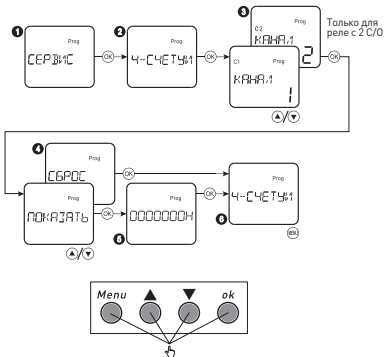


Select the menu item MODES, press the button OK. Then select the menu item HOLIDAY, press the button OK. Select the item ON to activate the mode, press the button OK. After that set the year, month and day to activate the OFF mode. To deactivate the HOLIDAY mode, select the item OFF and press the button OK.

Language selection:



Working hour counter:



Select menu item SERVICE, press the button OK. Select the item HOUR COUNTER, press the button OK. Select the channel, then select the item SHOW to review the number of working hours in the ON position. Select the item RESET to delete the working time. Press MENU to exit. Select the menu item SERVICE, press the button OK. Select the item BACKLIT, press the button OK. Select the item ON to illuminate the screen permanently or 2 MIN - backlit goes off after 2 minutes from the moment when the buttons were pressed last time. Press MENU to exit.

Factory reset:

0 Press and hold the buttons «MENU», «▲▼» and «OK» for 3 seconds at the same time, the configured programs and parameters will be returned to the factory settings.

No need for special maintenance of a product during operation. Tighten screw terminals of the timer once per 6 months.

4 WIRING DIAGRAM

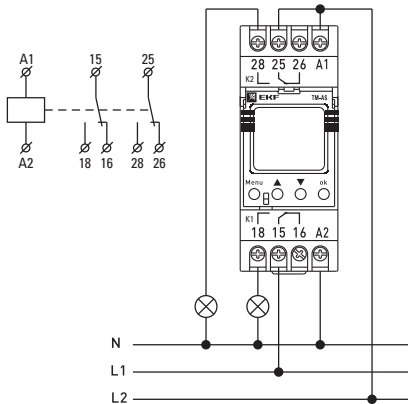


Fig. 4 Wiring diagram

5 OVERALL AND INSTALLATION DIMENSIONS

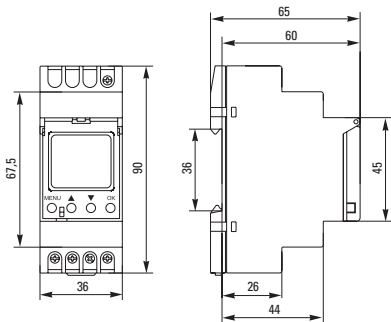


Fig. 5 Overall and installation dimensions

6 DELIVERY SCOPE

1. Astro digital timer TM-AS EKF - 1 pc.;
2. Technical manual - 1 pc.

For all available documentation, scan the QR-code on the insert or on the inside of the package.

7 SAFETY REQUIREMENTS

ATTENTION! The device uses potentially lethal voltage. By protection method against electric shock, the device belongs to protection class «0» according to GOST 12.2.007-75.

The device should be installed and maintained only by qualified electrical personnel.

Do not operate timers with visual mechanical damage.

For maintenance of timers, follow national safety rules for operation of electrical Installations.

Discontinue operating the timer, if visual damage to the timer housing is found.

Failure to follow the instructions in this manual may result in product malfunction, electric shock, or fire.

No need for special maintenance during operation, Tighten the screw terminals of the timer once per six months.

8 STORAGE AND TRANSPORTATION

The timers can be transported by any means of enclosed transport that prevents the packed products from exposure to mechanical and atmospheric impacts.

The timers shall be stored indoors in the original package at the ambient temperature from -40°C to +55°C and relative humidity of max. 80% at +25°C.

9 DISPOSAL

Life-expired and failed timers shall be disposed of in compliance with the national and local laws and regulations in force. To dispose of the product, send it to an authorized company for recycling in compliance with the national and local laws and regulations in force.

10 MANUFACTURER'S WARRANTY

The manufacturer guarantees the timers comply with the declared characteristics, provided that the consumer follows the operation, transportation and storage conditions.

Warranty period: 7 years from the date of sale.

Shelf life: 7 years from the date of manufacture.

Service life: 10 years.

Manufacturer: For information, refer to the product package.

Importer and EKF trademark service representative:

EKF ELECTRICAL SOLUTION – FZCO, Dubai Silicon Oasis, DDP, Building A2, Dubai, United Arab Emirates.

Importer and EKF trademark service representative on the territory of the Russian Federation: OOO «Electroresheniya», Otradnaya st., 2b bld. 9, 5th floor, 127273, Moscow, Russia.
Tel.: +7 (495) 788-88-15.

Importer and EKF trademark service representative on the territory of the Republic of Kazakhstan:

TOO «Energoresheniya Kazakhstan», Kazakhstan, Almaty, Bostandyk district, Turgut Ozal st., 247, apt 4.

11 CERTIFICATE OF ACCEPTANCE

Astro digital timer TM-AS has been approved for operation.

Date of manufacture:

For information, refer to the product package.

Technical control stamp



EAC



v3

ekfgroup.com

EFVEE