Bulletin No. PAXCK-X
Drawing No. LP0524
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SILGE ELECTRONICA S.A.
Av. Mitre 950 – B1604AKN - Florida Tel. 4730-1001-Fax: 4760-4950
Email: ventas@silge.com.ar Internet: http://www.silge.com.ar

MODEL PAXCK-1/8 DIN PRESET TIMER/REAL-TIME CLOCK

- *6-DIGIT LED DISPLAY*
- *ELAPSED TIMER W/ PRESET CAPABILITY*
- *REAL-TIME CLOCK CAPABILITY*
- *4 SEPARATE DISPLAYS (Timer, Counter, Real-Time Clock, and Date)*
- *CYCLE COUNTING CAPABILITY*
- *PROGRAMMABLE FUNCTION KEYS/USER INPUTS*
- *FOUR SETPOINT ALARM OUTPUTS (W/Plug-in card)*
- *COMMUNICATIONS AND BUS CAPABILITIES (W/Plug-in card)*
- *PC SOFTWARE AVAILABLE FOR METER CONFIGURATION*
- *NEMA 4X/IP65 SEALED FRONT BEZEL*

UL Recognized Component, File # E179259

GENERAL DESCRIPTION

The PAXCK (PAX Clock/Timer) offers many features and performance capabilities to suit a wide range of industrial applications. It can function as an Elapsed Timer, Preset Timer and/or a Real-Time Clock with Date capability. The Plug-in option cards allow the opportunity to configure the meter for the present application, while providing easy upgrades for future needs.

Out of the box, the PAXCK functions as an Elapsed Time Indicator. By using two separate signal inputs and 23 selectable timer ranges, the meter can be programmed to meet most any timing application. With the addition of a Plug-in Setpoint card, the PAXCK can easily become a dual or quad output preset timer.

The PAXCK can also operate as a Real-Time Clock (RTC), with the addition of the Plug-in Real-Time Clock Option Card (P/N - PAXRTC00). The meter is capable of displaying time in 12 or 24-hour time formats. The 12-hour format can be displayed in hours and minutes, with or without an AM/PM indication or in hours, minutes, and seconds. The 24-hour format can be displayed in hours and minutes or in hours, minutes, and seconds. The PAXCK is also capable of a calendar display in which the day, month and/or year can be displayed. The meter will recognize leap years, and can automatically adjust for Daylight Savings Time. The Real-Time Clock option has the ability to externally synchronize with other PAXCK meters to provide a uniform display network throughout the plant.

If the application calls for both a Preset Timer and a Real-Time Clock at the same time, the PAXCK can handle this requirement as well. The meter provides up to four different displays, accessed via front panel push buttons or external inputs. The displays are Timer (TMR), which displays the current timer value; Count (CNT), which displays the current cycle counter value; Date (DAT), which displays the current programmed date; and Real-Time Clock, which displays the current time. The Clock and Date displays are only active when the Real-Time Clock Option Card is installed.

The meter accepts inputs from a variety of sources including switch contacts and outputs from CMOS or TTL circuits. The input can be configured to trigger on the edge or level of the incoming pulse. Internal jumpers are available to allow the selection for sinking inputs (active low) or sourcing inputs (active high.)

The front panel keys and three user inputs are programmable to perform various meter functions. One of the functions includes exchanging parameter lists, allowing for two separate listings of setpoint values, timer start/stop values, counter start/stop values and RTC daily on and off values.

The meter can have up to four setpoint outputs, determined by the optional plug-in cards. The setpoint plug-in cards provide dual FORM-C relays (5A), quad FORM-A relays (3A) or either quad sinking or quad sourcing open collector logic outputs. The outputs can be assigned to the timer, counter, and RTC time. The outputs can also be independently configured to suit a variety of control and alarm requirements.

Plug-in cards can also provide serial communications. These include RS232, RS485 and MODBUS. Display values, setpoint alarm values and setpoint states can be controlled through serial communications. With the RS232 or RS485 communication card installed, it is possible to configure the meter using a Windows® based program. The meter configuration data can be saved to a file for later recall.

Once the meter has been initially configured, the parameter list may be locked out from further modification entirely, or the setpoint, timer start/stop values, counter start/stop values and RTC time can be made accessible. This lockout is possible through a security code or user input.

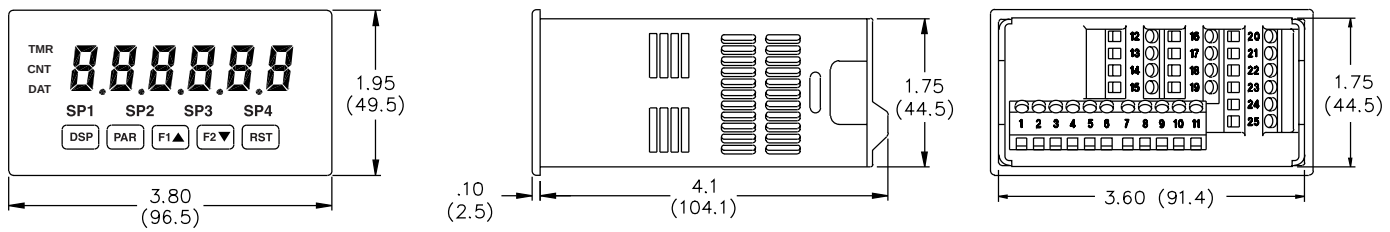
The meter has been specifically designed for harsh industrial environments. With a NEMA 4X/IP65 sealed bezel and extensive testing to meet CE requirements, the meter provides a tough yet reliable application solution.

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

CAUTION: Risk of electric shock.

DIMENSIONS *In inches (mm)*

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5" (127) W.



SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in this literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use this meter to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the meter.

SPECIFICATIONS

1. **DISPLAY**: 6 digit, 0.56" (14.2 mm) red LED
2. **POWER**:
   AC Versions (PAXCK000):
   AC Power: 85 to 250 VAC, 50/60 Hz, 18 VA
   Isolation: 2300 Vrms for 1 min. to all inputs and outputs. (300 V working)
   DC Versions (PAXCK010):
   DC Power: 11 to 36 VDC, 14W
   (Derate operating temperature to 40°C if operating <15 VDC and three Plug-in cards are installed)
   AC Power: 24 VAC, ± 10%, 50/60 Hz, 15 VA
   Isolation: 500 Vrms for 1 min. to all inputs and outputs (50 V working)
3. **SENSOR POWER**: 12 VDC, ±10%, 100 mA max. Short circuit protected.
4. **ANNUNCIATORS**:

TMR - Timer Display	SP1 - Setpoint 1 Output
CNT - Cycle Counter Display	SP2 - Setpoint 2 Output
DAT - Real-Time Clock Date Display	SP3 - Setpoint 3 Output
- Real-Time Clock Time Display	SP4 - Setpoint 4 Output

5. **KEYPAD**: 3 programmable function keys, 5 keys total.
6. **TIMER DISPLAY**:
   Timer Range: 23 Selectable Ranges
   Timing Accuracy: ± 0.01%
   Minimum Digit Resolution: 0.001 Sec.
   Maximum Least Significant Digit Resolution: 1 Hr.
   Maximum Display: 999999
7. **CYCLE COUNTER DISPLAY**:
   Counter Range: 0 to 999999
   Digit Resolution: 1 cycle
   Maximum Count Rate: 50 Hz
8. **REAL-TIME/DATE DISPLAY**:
   Requires optional Real-Time Clock plug-in card
   Real-Time Display: 5 display formats
   Hr/Min/Sec (12 or 24 Hr. format); Hr/Min (24 Hr.); Hr/Min (12 Hr. with or without AM/PM indication)
   Date Display: 7 display formats
   Month/Day or Day/Month (numeric or 3-letter Month format); Month/Day/Year or Day/Month/Year (all numeric);
   Day of Week/Day (3-letter Day of Week format)
9. **TIMER INPUTS A and B**:
   Logic inputs configurable as Current Sinking (active low) or Current Sourcing (active high) via a single plug jumper.
   Current Sinking (active low): V_{IL} = 0.9 V max., 22KΩ pull-up to +12 VDC.
   Current Sourcing (active high): V_{IH} = 3.6 V min., 22KΩ pull-down, Max. Continuous Input: 30 VDC.
   Timer Input Pulse Width: 1 msec min.
   Timer Start/Stop Response Time: 1 msec max.
   Filter: Software filtering provided for switch contact debounce. Filter enabled or disabled through programming.
   If enabled, filter results in 50 msec start/stop response time for successive pulses on the same input terminal.
10. **USER INPUTS**: Three programmable user inputs
    Logic inputs configurable as Current Sinking (active low) or Current Sourcing (active high) through a single plug jumper.
    Current Sinking (active low): V_{IL} = 0.9 V max., 22KΩ pull-up to +12 VDC.
    Current Sourcing (active high): V_{IH} = 3.6 V min., 22KΩ pull-down, Max. Continuous Input: 30 VDC.
    Isolation To Timer Input Common: Not isolated
    Response Time: 10 msec
11. **SERIAL COMMUNICATIONS CARD**: Field installable plug-in card
    RS485 or RS232 Card:
    Isolation To Timer & User Input Commons: 500 Vrms for 1 min.
    Working Voltage: 50 V. Not isolated from all other commons.
    Baud Rates: 300 to 19,200
    Data: 7/8 bits
    Parity: No, Odd or Even
    Bus Address: Selectable 0 to 99, Max. 32 devices per line (RS485)
    Transmit Delay: Selectable for 2 to 50 msec. or 50 to 100 msec (RS485)
    MODBUS CARD:
    Type: RS485; RTU and ASCII MODBUS modes
    Isolation To Timer & User Input Commons: 500 Vrms for 1 min.
    Working Voltage: 50 V. Not isolated from all other commons
    Baud Rates: 300 to 38,400
    Data: 7/8 bits
    Parity: No, Odd or Even
    Addresses: 1-247
    Transmit Delay: Programmable
13. **REAL-TIME CLOCK CARD**: Field installable plug-in card
    Time Accuracy: ± 5 secs./Month (1 min./year) with end-user calibration
    Battery: Lithium 2025 coin cell
    Battery Life Expectancy: 10 yrs. typical
    Synchronization Interface: Two-wire multi-drop network (RS485 hardware), 32 units max., operates up to 4000 ft.
    Isolation To Timer & User Input Commons: 500 Vrms for 1 min.
    Working Voltage: 50 V. Not isolated from all other commons.
14. **SETPOINT OUTPUT CARD**: Four types of field installable plug-in cards
    Dual Relay Card:
    Type: Two FORM-C relays
    Isolation To Timer & User Input Commons: 2300 Vrms for 1 min.
    Working Voltage: 240 Vrms
    Contact Rating:
    One Relay Energized: 5 amps @ 120/240 VAC or 28 VDC (resistive load), 1/8 HP @ 120 VAC, inductive load
    Total current with both relays energized not to exceed 5 amps
    Life Expectancy: 100 K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads
    Response Time: 5 msec. nominal with 3 msec. nominal release
    Timed Output Accuracy: ± 0.01% - 10 msec.
    Quad Relay Card:
    Type: Four FORM-A relays
    Isolation To Timer & User Input Commons: 2300 Vrms for 1 min.
    Working Voltage: 250 Vrms
    Contact Rating:
    One Relay Energized: 3 amps @ 250 VAC or 30 VDC (resistive load), 1/10 HP @ 120 VAC, inductive load
    Total current with both relays energized not to exceed 4 amps
    Life Expectancy: 100 K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads
    Response Time: 5 msec. nominal with 3 msec. nominal release
    Timed Output Accuracy: ± 0.01% - 10 msec.
    Quad Sinking Open Collector Card:
    Type: Four isolated sinking NPN transistors
    Isolation To Timer & User Input Commons: 500 Vrms for 1 min.
    Working Voltage: 50 V. Not isolated from all other commons.
    Rating: 100 mA max. @ V_{SAT} = 0.7 V max. $V_{MAX.}$ = 30 V
    Response Time: 400 µsec nominal with 2 msec nominal turnoff
    Timed Output Accuracy: ± 0.01% - 10 msec.
    Quad Sourcing Open Collector Card:
    Type: Four isolated sinking PNP transistors
    Isolation To Timer & User Input Commons: 500 Vrms for 1 min.
    Working Voltage: 50 V. Not isolated from all other commons.
    Rating: Internal supply: 24 VDC ± 10%, 30 mA max. total
    External supply: 30 VDC max. 100 mA each output
    Response Time: 400 µsec nominal with 2 msec nominal turnoff
    Timed Output Accuracy: ± 0.01% - 10 msec.
15. **MEMORY**: Non-volatile E^2PROM retains all programming parameters and display values.
16. **ENVIRONMENTAL CONDITIONS**:
    Operating Temperature Range: 0 to 50°C (0 to 45°C with all three plug-in cards installed)
    Storage Temperature Range: -40 to 60°C
    Operating and Storage Humidity: 0 to 85% max. RH non-condensing
    Altitude: Up to 2000 meters
17. **CERTIFICATIONS AND COMPLIANCE**:
    SAFETY
    UL Recognized Component, File # E179259, UL3101-1, CSA 22.2 No. 1010-1
    Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.
    Type 4X Enclosure rating (Face only), UL50

IECEE CB Scheme Test Certificate # UL2540C-179259/USA,
CB Scheme Test Report # 98ME60961-000098
Issued by Underwriters Laboratories, Inc.
IEC 1010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
IP65 Enclosure rating (face only), IEC 529
IP20 Enclosure rating (rear of unit), IEC 529

ELECTROMAGNETIC COMPATIBILITY

Immunity to EN 50082-2		
Electrostatic discharge	EN 61000-4-2	Level 3; 8 Kv air
Electromagnetic RF fields	EN 61000-4-3	Level 3; 10 V/m 80 MHz - 1 GHz
Fast transients (burst)	EN 61000-4-4	Level 4; 2 Kv I/O Level 3; 2 Kv power
RF conducted interference	EN 61000-4-6	Level 3; 10 V/rms 150 KHz - 80 MHz
Emissions to EN 50081-1		
RF interference	EN 55022	Enclosure class B Power mains class B

Note: Refer to the EMC Installation Guidelines section for more information.

18. **CONNECTIONS**: High compression, cage-clamp terminal block
Wire Strip Length: 0.3" (7.5 mm)
Wire Gauge Capacity: One 14 AWG (2.55 mm) solid, two 18 AWG (1.02 mm), or four 20 AWG (0.61 mm).
19. **CONSTRUCTION**: This meter is rated for NEMA 4X/IP65 indoor use. IP20 Touch safe. Installation Category II, Pollution Degree 2. One piece bezel/case. Flame resistant. Synthetic rubber keypad. Panel gasket and mounting clip included.
20. **WEIGHT**: 10.1 oz. (286 g)

ORDERING INFORMATION

TYPE	MODEL NO.	DESCRIPTION	PART NUMBERS
Meter	**PAXCK**	Timer/Real-Time Clock, Upgradeable, AC Powered	PAXCK000
		Timer/Real-Time Clock, Upgradeable, DC Powered	PAXCK010
Optional Plug-In Cards	**PAXCDS**	Dual Setpoint Relay Output Card	PAXCDS10
		Quad Setpoint Relay Output Card	PAXCDS20
		Quad Setpoint Sinking Open Collector Output Card	PAXCDS30
		Quad Setpoint Sourcing Open Collector Output Card	PAXCDS40
	PAXCDC	RS485 Serial Communications Card	PAXCDC10
		RS232 Serial Communications Card	PAXCDC20
		MODBUS Communications Card	PAXCDC40
	PAXRTC	Real-Time Clock Card	PAXRTC00
Accessories	**SFPAX***	PC Configuration Software for Windows 3.x and 95/98 (3.5" disk)	SFPAX

*Available as a FREE download from the Red Lion website. www.redlion-controls.com

OPTIONAL PLUG-IN CARDS AND ACCESSORIES

The PAXCK meters can be fitted with up to three optional plug-in cards. However, only one card from each function type can be installed at a time. The function types include Setpoint Alarms (PAXCDS), Communications (PAXCDC), and the Real-Time Clock (PAXRTC). The cards can be installed initially or at a later date.

Note: The PAXCK does not support the PAX Analog Card (PAXCDL).

SETPOINT ALARMS PLUG-IN CARDS (PAXCDS)

The PAX series has four setpoint alarm output plug-in cards. Only one of these cards can be installed at a time. (Logic state of the outputs can be reversed in the programming.) These plug-in cards include:

Dual relay, FORM-C, Normally open & closed
Quad relay, FORM-A, Normally open only
Isolated quad sinking NPN open collector
Isolated quad sourcing PNP open collector

SERIAL RS485 PLUG-IN CARD (PAXCDC)

An RS485 communication port can be installed with the serial RS485 plug-in card. The RS485 option allows the connection of up to 32 meters or other devices (such as a printer, PLC, HMI, or a host computer) on a single pair of wires not longer than 4,000 feet. The address number of each meter on the line can be programmed from 0-99. Data from the meter(s) can be interrogated or changed and alarm outputs can be reset by sending the proper command string. The function keys and user inputs can be programmed to send data to a printer or other device via serial communications.

SERIAL RS232 PLUG-IN CARD (PAXCDC)

An RS232 communication port can be installed with the serial RS232 plug-in card. RS232 is intended to allow only 2 devices, not more than 50 feet apart, to communicate to each other (such as a printer, PLC, HMI, or host computer). Data from the meter can be interrogated or changed, and alarm outputs can be reset by sending the proper command string. The function keys and user inputs can be programmed to send data to a printer or device via serial communications.

MODBUS PLUG-IN CARD (PAXCDC)

A MODBUS communication port can be installed with the MODBUS plug-in card. The MODBUS card uses standard RTU or ASCII MODBUS protocol, which allows the integration of devices of different types and manufacturers within a common communication framework.

REAL-TIME CLOCK PLUG-IN CARD (PAXRTC)

A battery-backed Real-Time Clock plug-in card can be added to the PAXCK. This option card, which includes a lithium coin-cell battery, will maintain the time and date when main power is removed.

PC SOFTWARE (SFPAX)

The SFPAX is a Windows® based program that allows configuring of the PAX meter from a PC. Using SFPAX makes it easier to program the PAX meter and allows saving the PAX program in a PC file for future use. A PAX serial plug-in card is required to program the meter using the software. The programming software and upgrades are available from the Red Lion website.

PAXCK PROGRAMMING QUICK OVERVIEW