

APCL-5/B16 FLASHCHANGER®

Automatic Power's newly-developed microprocessor-based unit is ready for service in the 21st Century. It packs a wide array of capabilities into one compact, lightweight and highly reliable package. It features a built-in RS-232 interface for direct connection of a radio modem when you are ready to monitor your lights. Occupying the space of a typical lampchanger, this unit can be placed in virtually every optic of 140mm diameter or larger. It frees up the space in the base of most lanterns (normally occupied by a typical flasher) for housing radio modems, Uniflash®-II GPS synchronizing system, power supplies, batteries, and battery chargers.

UNMATCHED VERSATILITY

The APCL-5 provides a wide array of advanced capabilities:

- Customer programmable via direct connection to on-board RS-232 (4800,N,8,1) with standard PC computer and windows based software.
- Pulse-width modulated voltage regulation system.
- Built-in RS-232 communications interface for direct connection to radio modem for monitoring/control or laptop computer for programming. RS-485 communications interface for long distance hardwire applications.
- Synchronization Terminal and Lampout Flag and Secondary Optic Control Terminal.
- Temperature Compensated Solar Charge Regulation.
- Electrical and Optical Monitoring of Lamp.
- Manual Switch or Radio Actuated Field Self-Test Routine.
- Photocell Daylight Control.

STATE-OF-THE-ART VOLTAGE REGULATION

The heart of the APCL-5 is a microprocessor which controls the pulse width modulated voltage regulation system. This system relies on switched field effect transistors (FET) to chop the direct current input voltage into a square wave pulse train. This system has two outstanding benefits:

- A. Unique high frequency system, typically, doubles the life of incandescent signal lamps due to reduced DC notching of the filaments.
- B. Regulation losses are less than 3% regardless of the input/output voltage ratio. 12-Volt lamps are efficiently powered from a 24-Volt solar power system while maintaining the same 12V or 24V battery bank capacity in watt hours and the same 12V or 24V wattage of solar arrays. Power cable sizes may be adjusted.

SUPERIOR ENVIRONMENTAL PROTECTION

The APCL-5 features several new environmental protection enhancements including gold contacts coated with corrosion inhibitor, double painted circuit boards, auxiliary motor cover, and shafts coated with high temperature lithium grease. Unit operates over the temperature range of -40°C to +70°C, with 0-100% relative humidity. Unit withstands soaking in a four-day high-temperature salt fog test and 15,000 volt static discharge test!



SPECIFICATIONS

- **Programmability:** Unit is programmed via its built-in RS-232/RS-485 communications interface by an IBM compatible computer with API windows based software. Unit retains programming through power interruptions.
- **Input Voltage:** 5-30 Volts DC.
- **Output Voltage:** Pulse-width modulated for voltages 0.2 volts above regulation point. 2% accuracy. Unregulated output tracking minus 0.20 volts below input for input voltage less than 0.2 volts above regulation point. Regulation point is programmable. Full voltage applied on all lamps. Parallel resistor on last lamp not required.
- **Output Current:** 5 Amps maximum.
- **Solar Charge Regulator:** 10 amp solar charge regulator with blocking diode prevents battery overcharge. Temperature compensated.
- **Lampchanging :** Four-place or Six-place unit with microprocessor-controlled stepper motor, accurate to fractions of millimeters, provides shock-free and index-free lampchanging. Unlike spring wound lampchangers, the full benefit of all the lamps on the turret is assured regardless of the lamp position initially selected. If all lamps have failed, autorotation and automatic lamp recheck after each photocell transition.
- **Power Consumption:** 5 milliamp flash or idle - day and/or night. 12 milliamps with RS-232/RS-485 active.
- **Reverse Polarity Protected:** Lamp burns fixed as indicator.
- **Daylight Control:** Standard resistance set at: 1700 ohms - switch on; 1200 ohms - switch off. Programmable.
- **Flash Rhythms:** .1% timing accuracy. 2 MHZ crystal controlled flasher timing keeps multiple units in synch over extended periods of time. Both user programmable flash rhythm and multiple factory programmed flash rhythms field selectable by means of hex switches.
- **Serviceability:** Large, screw-type, nickel-alloy plated, brass terminals for solar panel, battery, photocell, synchronization, and monitor/alarm/control output.
- **Environmental:** Operating temperature -40E C to 85EC. Relative Humidity 0-100 percent. High Temperature Salt Fog. 15,000 Volt Electrostatic Discharge. Gold plated contacts. Anodized frame. Auxiliary motor cover. Total corrosion treatment.
- **Monitoring via RS-232/RS-485 Serial Communication Interface:** System Voltage, Number of Operable Lamps, Photocell Status, Flash Rhythm, Flash Failure (Optically Verified), Flash Code Switch Setting, Rotation Status for a Rotating Beacon.
- **Control via RS-232/RS-485 Serial Communication Interface:** Remote On/Off, Flash Rhythm, Recount of the Number of Operable Lamps Remaining, Flash Synchronization, Vary Lamp Voltage.
- **Communications:** RS-232 or RS-485 interface built-in.

- May be switched on for programming-monitoring/control and switched off when not required to reduce power consumption. RS-232 (4800,N,8,1) interface ready for direct connection to radio modem for monitoring. RS-485 interface ready for hardwired monitoring with cable lengths as long as 1000 meters.
- **Synchronization:** Terminal provided to allow flashing of multiple lamps in unison via hardwire or UNIFLASH® - II wireless synchronization system. Sync output backward compatible with API products to 1982. Sync compatible with selected products from other manufacturers.
- **Rotation Monitoring (optional):** Synchronization terminal may be programmed as an input terminal for a rotation monitor for a rotating beacon. Failure may be posted as a closed contact on the FLASHCHANGER® Alarm/Secondary Optic Control terminal or rotation status may be included in the data string transmitted via the RS-232 interface.
- **Low Voltage Disconnect (optional):** Unit may be programmed with a low voltage disconnect/reconnect to prevent complete discharge of the battery. Programmable.
- **Self Test Feature:** Depressing test button on side of unit or closing contact by radio control initiates self test routine which starts by burning operating lamp fixed for predetermined period to assist in voltage measurements. Fixed burn is followed by the FLASHCHANGER® rotating to each lamp position and flashing in sequence the number of good lamps it has encountered to that point. e.g. one flash, two flashes, etc. as each good lamp is encountered. After all lamps have been sampled, the unit returns to normal operations. A limit of three self test routines are allowed each day. Specialized self test routines may be programmed.
- **365 Day On-board Timer (optional):** Unit may be programmed to provide 365 day on/off control of the light based on preprogrammed dates. Data is stored in EEPROM. No battery required to keep memory alive. Timer may also be used to date stamp data transmitted via the on-board RS-232/RS-485 interface.
- **Monitor/Alarm/Secondary Optic Control (optional):** Terminal provided that posts an open collector monitor/alarm/control for a secondary optic when all lamps have failed on the primary FLASHCHANGER®, or, as an option, when the last good lamp is in the operating position.

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