



'Powerwin™'

-Power Saver for Street Lights



Powerwin™ - Power Saver for Street Lights

Working principle: -

The development of Powerwin™ is based on the variable point voltage regulating & adjusting technology and the control theory is following: the input voltage is applied to the SCM through limiter sampling, low-pass filtering, signal reshaping, A/D converting, then the SCM sends out the control signal to adjust the output voltage through signal amplification, power drive switching.

The time frame can be given and on the basis of time, the variable control signals are fed to power drive system, which controls the voltage with specified level.

For Example:

A 100 Kva instrument is fitted at the street light feeder location for Power Saving application by controlling the voltage at different time schedule. We can provide 4/5 time zones to the device say

1) 7 PM 2) 9.00PM 3) 11.30PM 4) 5AM 5) 6AM

As per above time zone, the device would operate as follows:

- 1) At 07.00 PM, the device would start automatically in the FIRST time zone with regulating various parameters to achieve normal Power Saving up to 10%. This would be based on the supply voltage condition. This would continue up to 09.00 PM.
- 2) At to 09.00 PM, the device will automatically step into the SECOND time zone and regulate the parameter say Voltage parameter at our set point say 220Vac when supply voltage is 240Vac. As such a saving of more than 15% in Energy/Power could be achieved. This would continue up to 11.30 PM
- 3) At 11.30PM, the device will automatically step into the THIRD time zone and regulate the parameter say Voltage parameter at our set point say 160Vac when supply voltage is 240Vac. As such a saving of more than 35% in Energy/Power could be achieved. This would continue up to 05.00 AM
- 4) The above time zone will continue up to 05.00 AM and device automatically step into FOURTH time zone and reduce the regulation and come down to normal regulation point which was same as first time zone of 09.00 PM. In this time zone, we can expect normal Power saving of 15%.
- 5) In the last & FIFTH time zone, device would automatically cut down the supply at 06.00 AM and load will shut-off up to next time zone that is 07.00 PM.
- 6) The device would complete the cycle by turning on the supply to load again at evening 7PM.

Powerwin Features for GSM/GPRS Based Street Light Solution

The GSM/GPRS Based system to be installed for Street lighting project would be based on the following broad specifications for functions / features / hardware and software:

Advanced Microcontroller based design.

- Settable time power saver facility to reduce the power at late night and again restore in morning. It can program from CMS. (4/5 Power reduction levels can be adjusted from local panel 10%, 15% & 35 %). The specialty of power saving mode is uniform lighting thought street lighting which avoid dark spots on road compare with switch off alternate lights. Also it required lower capacity of power cable compare to alternate switch off type systems.
- Protective power saving feature - whenever input voltage is below certain level, it would not transfer to power saver mode until it reaches proper input voltage. This eliminates blackout or dark patches on the road.
- Settable time power staggering facility to switch OFF the line at late night and again restore in morning. (Save energy when no traffic) It can program from CMS. Individual Phase can be staggered at different times. Also it is incorporate with rotation one line staggering facility for equal burning hours of lamp.
- Eight Date range programming facility to disable staggering mode for festival and special occasion.
- Night dimming / staggering and intelligent control reduces burn hours and increases the lifespan of lamps with 30-40%.
- Power redundancy for controller - even at 1 phase 170V, controller can work. AC (i.e. Even in single phase control systems will work. In-built Protection for energy saving device).
- Auto Calibration of Systems for monitoring Load current for protection.
- Over and under voltage cut off user settable. Saves lamps and energy. Auto reset type over voltage and under voltage cut off.
- Electronic short-circuit protection.
- Settable incoming. Neutral open alarm for specially when unbalance load. (Optional for protection which protect lamps against high voltage.)
- Over current trip in % is user settable. It has special function to store load current of each line & channel in memory. When over load will be detected it will trip that particular phase after defined no. of retries.
- No harmonics generation while power saving.
- Wireless GSM systems with software for constant monitoring, controlling and logging of switching on time, RTC data, electricity parameters and faults. Reports can be generated as per user requirements.

- GSM based systems are among the most inexpensive wireless technologies available. GSM based wireless, system would eliminate any need to establish cable connection for signals/communication and would be easily install.
- Input and output terminals as well as all electrical components used in all the GSM/GPRS Based panels would be of ample capacity for the load of the particular switching point under which the same is installed.
- Expandable to new areas.
- Fast detection of errors, with indication by feeder / pole and along with GSM communication of the errors, to ensure that the street lights are always online, and any fault in street lighting electrical circuits is known to the operator within short time.
- Unit is self-generate data messages like, ON time, OFF Time, Power Down time, Auto mode, Manual Mode, Volt Fault, Over Current Fault, Short Circuit Fault, Neutral Fault, RTC Fault, Memory Fault, Low Ampere Fault, Door
- Real time clock with inbuilt battery with life of more than 10 years (Life for the real time clock battery with the accuracy of +/- 60 second per month).
- Street light ON / OFF on Longitude / Latitude based sunset and sunrise time generation.
- Blackout protection while in power down mode.
- Controller operates 365 days on real-time based clock with auto calculation of sunrise and sunset times as per geographic location.
- System parameter data protection with special RAM, which hold the parameter for more than 10 years without any power.
- Month wise civil twilight timings (Day light power saving) which helps precise ON / OFF time in all weathers (Advantage of Sunlight before sunrise and Sunlight after sunset).
- Include Master and user Password Protection.(As the systems are installed at remote locations and in open conditions password protection is most essential to prevent tampering, which create problem for street lighting operation)
- Very easy key board operation.
- HMI LCD display. 16 character and two line type display. Which helps while maintenance and reduce dependability of CMS and contentions Scrolling display of events (Like ON time, Off time, Voltage, Current, Staggering time, Alarm events, Burning hours, etc) on Single HMI LCD display to help the local monitoring of systems. Parameters can be updated from local panel.
- Multi-Function Panel mounted Energy meter Class 0.5 type which continuous scrolling display of individual phase voltage, load amps, PF, KW, KVA, KVAR, Phase to Phase voltage, Avg. PF, KWH etc. (Local display of 36 and 28 for remote display in software)

- Inbuilt auto recovery systems for power failure which helps in streetlight operation.
- Door Open information.
- Auto / Manual facility by way of contactor / relay operation for faster service mode.
- Local panel in manual mode it shows individual line / channel current and show no of lamp which is not working which helps to judging the problem in line (by difference of calibration current and existing line current. Judgment is possible for approximately find out no of lamps are not working.
- Open, Relay Fault, Calibration Data, and acknowledge the message received from master like E Stop, Test Mode, Live Status, E Profile, parameter update. All these messages contain all relevant electrical parameters with real-time clock date and time, sent to software through GSM systems.
- Output MCB protection

Product characteristics:

- Software used for control, it is easy to use with user friendly design and operation. The **Powerwin™** can be operated individually and also by the customer control system.
- The warm-up time can fully meet by providing starting delay of 20 Minutes.
- Different power saving levels (Level 1, Level 2, Level 3...), can be set according to different conditions, with auto fault protection, it can work safely.
- The system Manual bypass should be functioned when the load current exceeds 1.25 time of the rated current.
- The system auto tripped will be functioned when the Input voltage is lower than 150V.
- With easy communication, safe and intelligent control, high power saving performance

Protection functions: -

- Over-load protection
- Over-voltage protection
- Under-voltage protection
- Short cct. Protection



Powerwin™-Power Saver for Street Lights-Models:

- 1. TPPS-SL5 : 5 Kva, 3-Phase, 50 Hz**
- 2. TPPS-SL7 : 7 Kva, 3-Phase, 50 Hz**
- 3. TPPS-SL10 : 10 Kva, 3-Phase, 50 Hz**
- 4. TPPS-SL15 : 15 Kva, 3-Phase, 50 Hz**
- 5. TPPS-SL20 : 20 Kva, 3-Phase, 50 Hz**
- 6. TPPS-SL25 : 25 Kva, 3-Phase, 50 Hz**
- 7. TPPS-SL35 : 35 Kva, 3-Phase, 50 Hz**
- 8. TPPS-SL45 : 45 Kva, 3-Phase, 50 Hz**
- 9. TPPS-SL60 : 60 Kva, 3-Phase, 50 Hz**
- 10. TPPS-SL75 : 75 Kva, 3-Phase, 50 Hz**
- 11. TPPS-SL90 : 90 Kva, 3-Phase, 50 Hz**
- 12. TPPS-SL110 : 110 Kva, 3-Phase, 50 Hz**