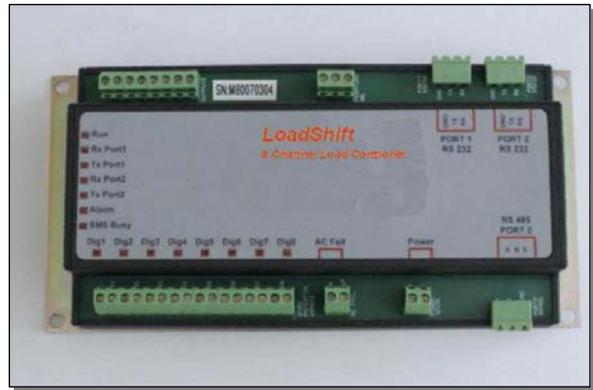# Advanced Monitoring Solutions

Loadshift Demand/Load Controller Brochure

L oadShift is an electrical load shedding unit used for limiting peak electrical demand in an electrical system to target levels. The unit employs predictive control logic to estimate the amount of energy that needs to be shed. The amount of energy required in a predetermined future period is clculated by analyzing current and past energy consumption, current load

L O A D S H I F T

🗀 Load Control

✏ Predictive Shedding

🖥 Load Profiling

📖 Priority Loads

shedding, and error factors indicative of the random energy demand characteristics of the electrical system. The unit then estimates the amount of energy that needs to be shed in view of the forecast of the amount of energy required in the predetermined future period. The apparatus selects non-essential loads for shedding until the required target is reached. The swithching of the loads is done via 8 onboard relays which in turn swithches contactors that disconnect specified loads from the electrical system.

Control Algorithm

T he main elements of the load control strategy are the Shed Line and the Reset Line. Both the start and the end points of these lines are user programmable. The Shed End point represents the target Demand in kVA. At the start of a demand block all loads are returned to On, assuming that none of the control relays were programmed with a minimum On or Off time. LoadShift calculate the predicted demand every 30
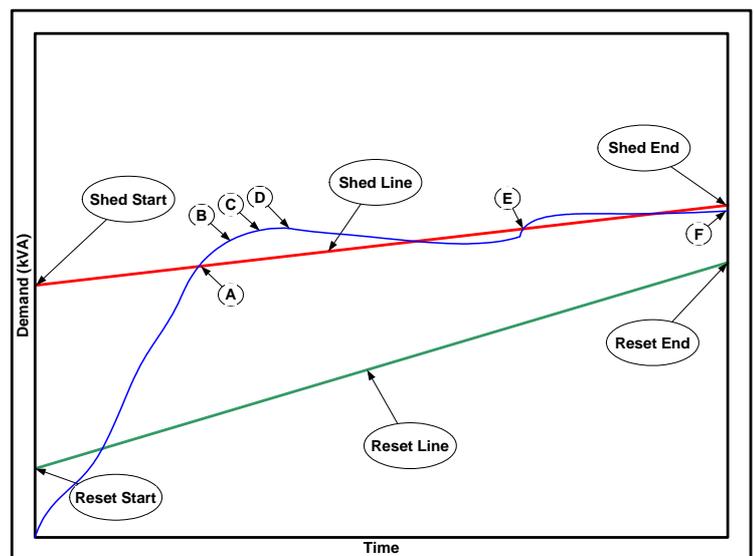
seconds based on the history and the present consumption. In the beginning the predicted demand may exceed the target demand, but loads will only be shed once the accumulative demand exceeds the shed line. In figure 1 this condition occurs at point A. At point B it is determined that the predicted demand will exceed the target and the first load with the lowest priority will be shed. This condition occurs at Point C and D. Only after the load shed at point D occurred the predicted demand will not exceed the target. Just before point E a sudden increase in load causes the predicted demand to exceed the target. After point E further loads were turned off to achieve the desired demand below or equal than the set target.

Load Priority

Each load can be assigned a priority from 1 to 3. Loads with priority 1 have the lowest priority and loads with priority 3 the highest. Loads with the lowest priority will be turned off first and turned on last. Loads with the same priority will be circulated.

On/Off Times

Each control relay can be assigned a minimum or maximum On and Minimum Off time. These times can be programmed by the user. Min/Max On/Off Times will override all conditions issued by the demand controller algorithm.

There are two switching timers (programmable) available, where the one timer tedermines the delay before swithing OFF the next step and the other determines the delay before switching ON the next step. These two timers ensures that the switching of the loads do not occur to quickly in succession

Auto Rachet Function

In the event of the target limit being exceeded, LoadShift will automatically adjust the target demand to the new value. The original demand target will be restored once a month-end sync event occurs. A pre-programmed percentage of the demand needs to be exceeded before the rachet function is activated.

Seasonal Demand Setup

S easonal variables can be pre-porgrammed, making provision for high demand and low demand seasons. The LoadShift controller also destinguishes between weekdays, Saturdays and Sundays and the peak hours (time of day during which the loads must be controlled) can be specified for each one of these days. Holidays can also be programmed and each holiday is selected to have the same control as a Saturday or Sunday.

SMS Notification

L oad shift can inform a user via SMS in case of certain error or alarm conditions. Typical SMS alarms include.
  ➢ Loss of any one of the four pulses from the utility meter
  ➢ Demand above a certain level and power factor below a certain level
➢ Demand above a certain level
➢ Ratchet function implemented
➢ Month End Event with consumption and demand readings for month
➢ Power Failure / Power Restore

Load Profile Recording

L oadShift records the profile for each demand block. This profile is stored in internal non volatile memory. The info can be retrieved via any of the serial ports for later analysis. LoadShift saves the last 2000 samples, which equates to about 40 days at ½ hour periods.

Event Recording

L oadShift records and timestamp certain predetermined events. These events include:
  ➢ Change of state of the 8 control relays
  ➢ Change of state of the last 4 digital inputs
  ➢ Month end events
➢ Power fail and restore events

These events are stored in internal non volatile memory and can be retrieved at a later stage for analysis.

Software

T he LoadShift software package provides a platform from which the controller can be remotely accessed. The software allows the user to remotely program the units, view the status of the switching operations and download load profile and event data. The data are then presented in graphical and text fromats including various statistical and reporting facilities. The software also incorporates an SMS engin which manages the incomming sms's from various controllers and distributes these sms's to the relevant personal.