

BLUE POINT Autonomous (Man Out of the Loop)
RAIL HEATING CONTROL

- Blue Point – an intelligent, automated system**
Intelligent use of weather forecast, local weather station and rail temperature feed-back
- Rock solid autonomous (Man out of the Loop) control system**
A proven 30 year record of successful installations in the railway environment
- Nominally energy efficient with ability to deliver extreme heat when needed**
Heat delivery via a Pulse Width Modulation (PWM) Patent Pending design scheme provides the ability to deliver the precise amount of heat desired up to 500 watts/foot
- Power modulation with redundancy**
The dual element design provides the ability to deliver the amount of heat desired with the inherent redundancy of a two element format
- European technology adapted to North America**
Omni Control Technology of Whitinsville, MA Assembles & Supports SAN Electro Heat Heating Systems from Europe

An automated control system that assures reliable railway traffic through switch heating & 3rd rail heating during icing and/or snow conditions.

Blue Point operates in an autonomous standalone state. Blue Point runs a complete SCADA system that can be viewed remotely, through any web browser, and/or at the enclosure itself. The SCADA system is hosted on a dedicated secure cloud server or internally at the Railroad.

The heart in all Blue Point control solutions is a rock solid RTU (Remote Terminal Unit – advanced PLC). This intelligent device runs the SCADA system and is programmed to control the power, based on individual parameter settings and multiple inputs such as the local weather, weather forecast, rail temperatures, etc.

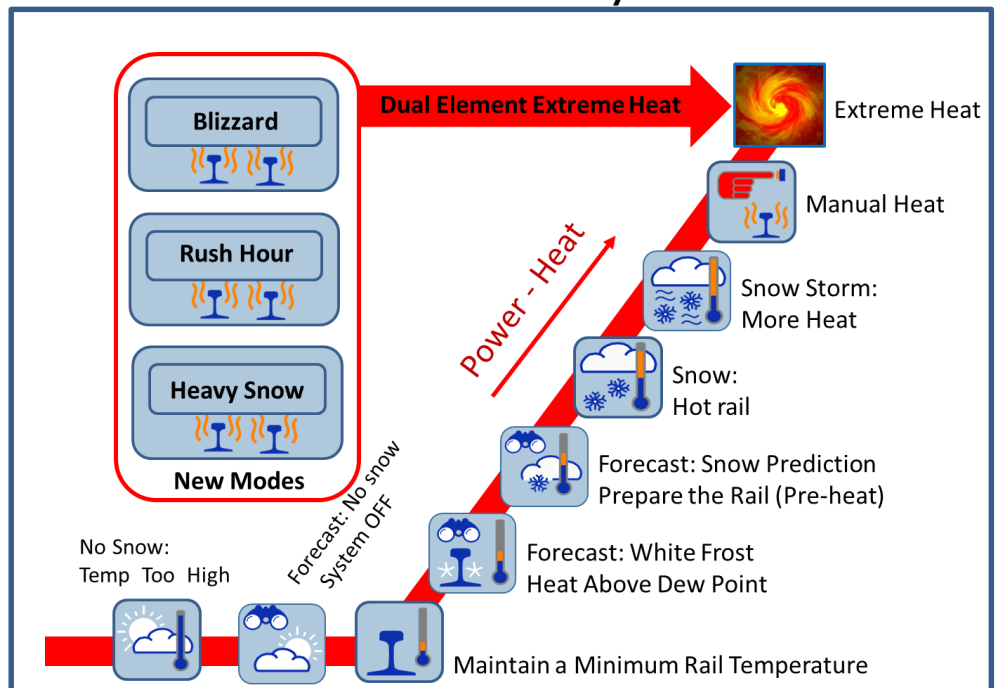
The RTU collects information about power consumption and statistical performance data. The RTU handles all communication with other Blue Point enclosures and/or to the SCADA software.

To make the system easy to maintain, self diagnostics report any errors that might occur (e.g. communication error, heating element failure, power loss, sensor errors etc); this makes it possible to respond proactively.

Several fail-safe modes are incorporated to secure the main purpose – keep the switch points free of snow...



Blue Point SCADA System



Blue Point Enclosure

The Blue Point enclosure manages and executes all automated control for switch heating and third rail heating. The cabinet is designed for the railway environment and contains all necessary electrical components to source power and protect the system.

To avoid trenching of new power/heater lines an existing power/heater line, or one new power/heater line, is used. This single line is then modulated according to the weather conditions keeping a lower nominal wattage but able to attain extreme heat if needed and drive two heaters.

The dual elements are broken out at an intelligent junction box, located next to each turnout, that uses the existing heater power line and then isolates the heaters from each other so that true redundancy and isolation is attained should one heater fail.

Blue Point Systems can be arranged in a Master/Slave arrangement for yards and other situations where multiple systems are in close proximity. This allows for a cost savings of sharing of weather and sensor data.

The list below details some of the functional capability and states of the Blue Point system:

Self diagnostics:

- Power failure
- Power phase failure
- Communication error
- Switch point heating element error
- Temperature sensor error

Switch Heating Control based on:

- Configurable settings
- Measured cold rail temperature
- Measured hot rail temperature
- Measured weather inputs
- Received weather forecast

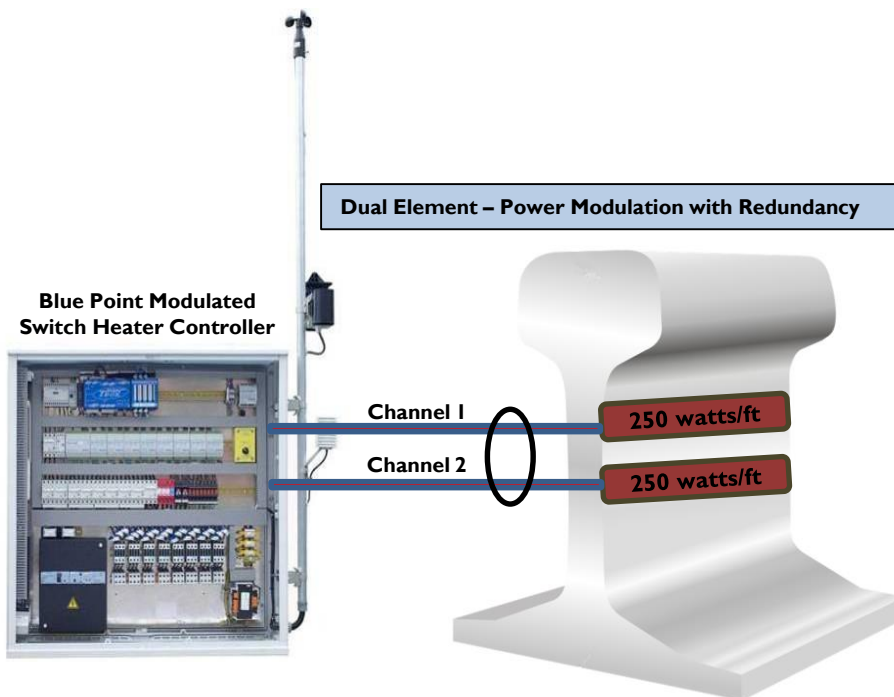
Energy statistics:

- Power hour counter
- Energy consumption
- In/Out cycles
- Operation time in all operation modes

Communication:

- Communication with all adjacent Blue Points
- Communication with SCADA supervision system
- Communication with connected PC (Maintenance)

Pulse Width Modulation (PWM) (Patent Pending) – Switch Heating



- Pulse Width Modulation (PWM) (Patent Pending) Regulates The Duty Cycle of the Heaters to Attain a Specific Wattage
- A Single Element may not Provide Enough Power for Extreme Conditions – Dual Elements Provide Extreme Power – up to 500 w/ft
- The Blue Point SCADA System will Regulate the Duty Cycle According to Need Based on Sensors and the Attached Weather Station
- Blue Point and PWM Provides for:
 - Extreme Heat When Needed
 - Nominal Energy Savings
 - A Redundant Heating Path
- SAN & OMNI have Applied for a Patent on PWM for Switch Heating – currently Patent Pending

Extreme Heat When Needed, Nominally Energy Efficient and Redundant Elements

Blue Point is available in various Primary Power and Physical configurations – See Technical Specifications.