



# Temperature Monitoring of Multiple Borehole Heat Exchangers

## Hamburg, Germany

When the Hamburg Ministry of Urban Development and Environment moved into their new buildings they decided to make use of geothermal heat exchange pipes to heat the buildings in Winter and keep them cool in Summer. Over 1600 boreholes and borepiles were drilled and heat exchangers were installed in over 800 borepiles. In 27 boreholes fiber optic sensor cable was also installed to enable temperature monitoring with AP Sensing's DTS (Distributed Temperature Sensing) solution.



*Hamburg Ministry of Urban Development and Environment*

The well-insulated buildings are among the most energy-efficient offices in Germany, requiring only 70 kWh per square meter per year.



*Joint box used to connect cables  
during installation*



*19" AP Sensing DTS device mounted  
in a flat wall cabinet*

