NetOptimus
Automatic cost optimized FTTH / FTTX network design.

Complex optimization algorithms, in a simple to use graphical tool.
NetOptimus
FTTH / FTTX network engineering for **1000 homes**:

Manual engineering versus Automatic with NetOptimus

- **16 hours** vs. **<1 hour** improved network design
- **1000+ calculations** vs. **10.000.000+ calculations**
Savings, a calculation example for 1000 homes:

- Improved grouping homes
- Best DP positioning
- Improved routing

Resulting savings:
- 20% less drop cable
- 2% less distribution cable
- 2% less trenching costs
## Design procedure (1000 homes)

<table>
<thead>
<tr>
<th>Survey</th>
<th>Data preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Building properties:  1½ hour / 1 minute (import)</td>
</tr>
<tr>
<td></td>
<td>Possible trails/lines:  1 ½ hour</td>
</tr>
</tbody>
</table>

### 1: Input

- **Number of designs:** 1
- **Required time:** 2 days
- **Estimations:** 1000+

### 2: Design

- **Network design for 1000 homes**
- **By an experienced FTTH / FTTX engineer**

#### Manual
- **Number of designs:** 1
- **Required time:** 2 days
- **Estimations:** 1000+

#### Automatic with NetOptimus
- **Number of designs:** >100
- **Required time:** 45 minutes
- **Calculations:** millions

### 3: Output

- **Network blueprint**
The design process starts with the area map
Insertion of the buildings and trails
Automatically made (green) garden trails
View of the building properties and trails
Manual engineering
1 design, based on 1 starting point

NetOptimus
All designs, all starting points

Based on the logical grouping of the remaining homes

Based on installation and material costs
NetOptimus

Lists all alternative designs with their installation & material costs.
NetOptimus

By simply selecting a solution from the list the design is shown.
The automatically made design
Multiple levels and network concepts

DP areas
Building ↔ DP

Distribution net
DP ↔ Cabinet

Feeder cables
Cabinet ↔ POP
The automatically made design viewed in Autocad

Input

Output
Possible trails

Manual \leftrightarrow Automatic

<table>
<thead>
<tr>
<th>Material</th>
<th>Manual €/m</th>
<th>NetOptimus €/m</th>
<th>Manual – NetOptimus =</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main trench</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Road crossing</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Drop cable</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Distribution cable</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Microduct 2-way</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Microduct 7-way</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Savings:

€ 2232
(238 homes)
€ 9,38 / home
Possible trails

<table>
<thead>
<tr>
<th>Material</th>
<th>Manual</th>
<th>NetOptimus</th>
</tr>
</thead>
<tbody>
<tr>
<td>€/m</td>
<td>€/m</td>
<td>Manual – NetOptimus =</td>
</tr>
<tr>
<td>Main trench</td>
<td>0.3</td>
<td>m</td>
</tr>
<tr>
<td>Drop cable</td>
<td>1.8</td>
<td>19.6</td>
</tr>
<tr>
<td>Distribution cable</td>
<td>1.8</td>
<td>818.9</td>
</tr>
<tr>
<td>Microduct 2-way</td>
<td>2.8</td>
<td>-45.5</td>
</tr>
<tr>
<td>Microduct 7-way</td>
<td>2.8</td>
<td>-45.4</td>
</tr>
</tbody>
</table>

Savings:

€ 856
(88 homes)
€ 9,70 / home
Possible trails

Shortest cable routes

NetOptimus

+ 3.8% cable meters
- 4.3% main trench meters
10% savings or € 9 / Home
NetOptimus

Automatic FTTH / FTTx Network design and cost optimization. NetOptimus uses smart Algorithm’s to swiftly create multiple alternative network designs.

**Easy input** of the material and labour unit costs per project.

**Best, cheapest**, grouping of FTU’s, network routes/trails and central positions.

The engineer can simply **overrule** the system and favor/block certain trails and favor certain (already known) manipulation point positions.

**Multiple level** design: Distribution network; Feeder network etc.
**NetOptimus CAD tools:**

NetOptimus comes with CAD tools for automatically processing the required input data and for the processing of the NetOptimus data into detailed CAD designs.

**NetOptimus CAD tools:**
- Import of building properties.
- Line trace functions for possible trails creation.
- Automatic garden trail creation, building ↔ main trail connection.
- Automatic line segmenting at line intersections.
- Line connection checks.
- Line overlay and crossing checks.
- Building connection check.
- Automatic coordinate corrections.

**Export data to NetOptimus.**

**Import data from NetOptimus.**
- Automatic creation of cables and manipulation points.
Visualization options

NetOptimus: Design mode

NetOptimus: OpenStreetMap

NetOptimus: BAG (NL)

NetOptimus: Aerial Photo’s (NL)
Visualization options

The NetOptimus design directly shown in Google Earth
The ITS Software Suite

**NetDesign**
FTTH / FTTX Design

**NetProject**
Project Management

**NetID**
Network Registration

**Design of complete FTTH / FTTX-networks**
- AutoCAD® based and creation of all required drawings.

**Simplifies building of complex networks**
- Managing of all labour, quantities & costs.

**Registration & Documentation**
- Creation of fiber connections / jointing reports. Integrated GIS.
ITS Software Suite
Design, Build, Document

Some references

Africa: Ghana; Mali; Rwanda; Tanzania; Zimbabwe

Asia: Kazakhstan; Sri Lanka; Vietnam

Caribbean: Curacao

Europe: Denmark; England; Germany; Netherlands; Norway; Scotland; Sweden; Switzerland

Middle East: Qatar
**Reference details for the Netherlands.**

Mayor contractors in the Netherlands work daily with the ITS Software Suite to engineer and install FTTX networks.

<table>
<thead>
<tr>
<th>Year</th>
<th>Homes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>15.000</td>
</tr>
<tr>
<td>2009</td>
<td>40.000</td>
</tr>
<tr>
<td>2010</td>
<td>50.000</td>
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<tr>
<td>2011</td>
<td>70.000</td>
</tr>
<tr>
<td>2012</td>
<td>120.000</td>
</tr>
<tr>
<td>2013</td>
<td>200.000</td>
</tr>
<tr>
<td></td>
<td>495.000</td>
</tr>
</tbody>
</table>

Most projects include a mix of low- and high-rise buildings.
Reference details for the Netherlands.
Who are we?

We are a team of specialists with a vast experience in Telecom, network engineering, project management and IT.

In the past 20 years we made software for Telecom projects. With our software networks for many millions of homes were designed and installed.

January 2013: we did a management buy-out and acquired all software rights and activities of Draka / Prysmian Group’s Software department.
NetOptimus™

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Thank you!

More info: www.itsimplicity.nl