

CABLEMANAGER

USER MANUAL



Overview of cables and cable ways – from design phase to maintenance

Version 6

Developed by PCSCHOMATIC A/S

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THE STRUCTURE OF THE CABLEMANAGER MANUAL

The Cablemanager manual consists of the following parts:

- Part 1: Cablemanager Service – User Manual
 - This manual describes the functions in Cablemanager Service
 - The manual covers what a Read-only user can do in the main program

- Part 2: Cable manager – User Manual (the current booklet)
 - How to create cables, cableways and other objects
 - How to perform batch actions
 - Report functions
 - Settings
 - User management and user rights

- Part 3: Data structure and Import functions
 - Understand the data structure
 - Code tables and Main tables
 - How to use the Import Wizard

- Part 4: Installation manual
 - How to install the program
 - How to install the database



PREFACE

The PCSCHMATIC Cablemanager program presents an overview of all cables and cable ways in a construction project – of either infrastructure or machinery – from the preliminary design phase as well as during the subsequent maintenance. Requirements about documentation of parallel cables to avoid excessive heat development are easy to fulfil with this tool.

Overview of all data for cables and cable ways

PCSCHEMATIC Cablemanager keeps track of all data for cables, cable ways, glands, transits and – not least – the location of cables on cable ways.

For each cable, the program shows the dimensions, where it starts and ends, the segments and the transits it goes through.

Where to pull the cables – during the design phase and during maintenance

When the cable ways are defined in the design phase, the program will show the shortest routes for the cables thereby making it easy to decide the final dimensioning of cable ways. The program maintains an overview of all cable ways and gives an automatic warning when it registers an overload. Different subcontractors can always see their part of the project, so they only need to take their 'own' cables into account and so that will be able to manage the cables that are part of their sub project.

During the subsequent maintenance works, the program shows where new cables can be pulled without overloading existing cableways. Cable lengths are calculated automatically.

Overview of cable status

A status is assigned to all cables in order to ease communication between all involved parties – the status can be created, routed, pulled, terminated or approved. The status assignment makes it easier to maintain an overview for the design engineers, the pulling crew as well as for the installation crew.

Overview of individual cable ways

The PCSCHMATIC Cablemanager also gives an overview of the number of parallel cables in all cable ways, which makes it easy to manage current correction factors for all cables.

For each cable, the number of parallel cables in any segment on its route is listed.

See all cables in a 3D view

The built-in 3D viewer lets you see all cables in the project, with a dynamic highlight of overfilled cableways.

You can see all cables at once, or select only specific parts of your installation. The 3D tool makes it easy to get an overview of the critical cable ways without going through reports.

CONTENTS

The structure of the Cablemanager manual.....	Fejl! Bogmærke er ikke defineret.
Preface	3
Overview of all data for cables and cable ways	3
Where to pull the cables – during the design phase and during maintenance	3
Overview of cable status	3
Overview of individual cable ways	3
See all cables in a 3D view	3
What to see where in the program (All users)	9
Open the project.....	9
Navigation and other practical info when you open the project.....	10
Cables	11
The top part	11
The lower part.....	12
Equipment	15
The top part	15
The lower part.....	16
Cableways.....	17
The top part	17
The lower part.....	18
Nodes	19
The top part	19
The lower part.....	19
Create and edit parts.....	20
Overall data structure in the Cablemanager	20
Overall workflow when making a project	20
The code tables	21
The main tables.....	21
Cables	21
Equipment	21
Cableways.....	21
Segment & Nodes.....	21
Create equipment	22
Create equipment directly in the program	22
Edit equipment	22
The main tab	23
Create terminal rows on the equipment	23
Batch functions – Equipment.....	24
Import and update equipment	24
Create nodes	25
Edit nodes	25
Import and update nodes	25
Batch function – Nodes.....	26
Create Cableways.....	27
Create a new Cableway	27
Edit a Cableway	29
Import and update Cableways	30
Batch function – Cableways.....	31
Create Cables	33
Create a cable directly in the project.....	33
Import and update Cables	34
Cable status codes	35
Route one cable	36
Force the cable route	36

Route like	37
Route manual	37
Auto route	37
Optimize ... automatic function	38
Optimize manually – move a cable on the selected cableway	38
Wiring.....	39
Calculations.....	40
Cable batch functions (super user)	41
Batch route.....	41
Optimize route	41
Unroute/Reset status.....	41
Batch print.....	41
Cable list report.....	42
Generate Pulled Card sent template	42
Generate wires.....	42
Change cable type	42
Change status	42
Change system.....	42
Change numerical parameter	43
Change nodes	43
Change reference installation method	43
Delete	43
Report options (All users)	44
Cable reports.....	45
Search list.....	45
Cable type report	45
Cable status report	46
Cable pull report	46
Cable termination report	47
Route load	47
Cable connections	47
Check for overload	48
Voltage Drop	48
Routing information (from Cable batch functions).....	48
Equipment reports	49
Search list.....	49
Nearest node.....	49
Cables from/to	50
Termrow connections.....	50
Cableway reports	51
Search list.....	51
Cableway Type Usage report	51
Cables on Node connection (Cableway/segment)	51
Nodes reports.....	52
Search list.....	52
Attached to segment	52
Attached to nodes.....	52
Check data function	53
Check Cable routes.....	53
3D view	54
3D viewer.....	55
User administration (Admin)	56
Create, change, or delete a user	56
Create a user	56
Change user rights	57



User rights.....	57
Settings	58
Project settings.....	58
System settings	59
Report logos.....	59
Projects	59
License	60
Language.....	60

WHAT TO SEE WHERE IN THE PROGRAM (ALL USERS)

This section is a 'guided tour' through the program, and shows what type data is handled in the program. It goes through all windows that can be accessed in the Cablemanager Service program and by a Read-only user.

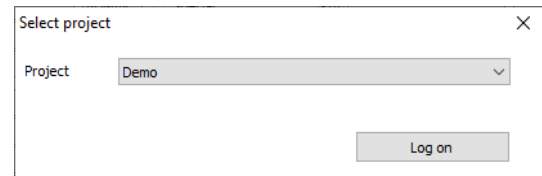
The following sections will take you through how to create and work with the data.

Open the project

Start by opening the demo project:

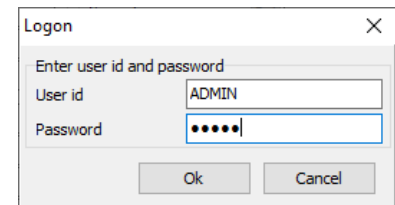
Press the Open icon in the toolbar, and select the Demo project from the dropdown list:

The Demo project contains data from The Factory, and this database is used throughout this manual, whenever there are any examples



The database is password protected. When opening the program the very first time, there is only the ADMIN user with the password ADMIN.

See how to create more users and about user properties on page 56.

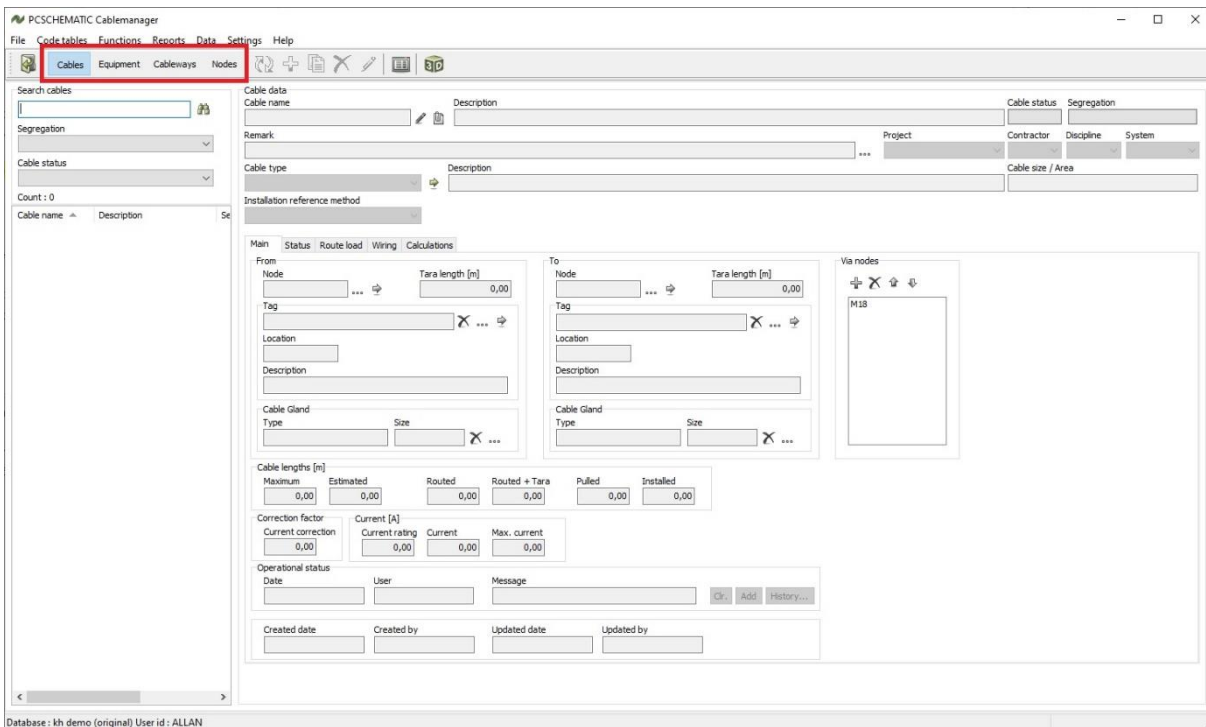



In Settings you can change your own password at any time.

Navigation and other practical info when you open the project

When the program is open, the program window is empty. In the top part, you can now select Cables, Equipment, Cableways or Nodes.

This chapter takes you through the menus and explains the type of data that you see in the different sections.




You can jump between the windows: some times, there is an arrow . If you click on it, it takes you to some deeper information, e.g. – see above – you can go to a Cable's Node or to its connected Tag/equipment page.

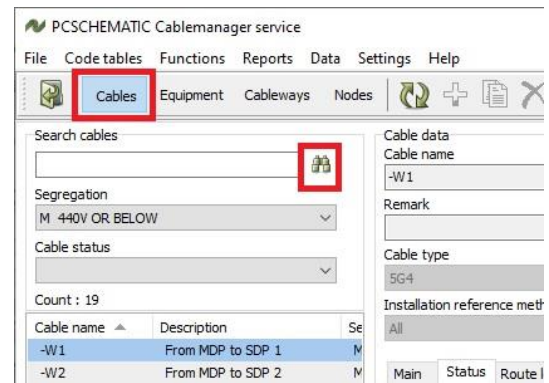
Other times, simply double-click on information to go to another page.



Cables

Load cables by pressing the show button 
 Search by typing a text in the search window or use the Segregation and/or Cable status for filters, and then press the Show button.

When you have a large project with many cables, the filters become very important, as it makes it easier to find the exact cables.




The top part

Select a cable in the list to the left to see all data for this cable.
 The top part of the window shows the the basic cable data:

- Cable name and description
- Cable status
- Segregation
- Remarks, if any
- Project, Contractor, Discipline and/or System codes

In case there are attached documents to the cable, open them by clicking the clip beside the cable name.

Also shown are the cable type and description of the current cable. If you press the  beside the cable type, you are lead to the code table for cable types which contains more details about the cable type.


The lower part

The lower part is divided into different tabs: Main tab, Status, Route load, Wiring and Calculations.

The Main tab

At the top is data about the two Equipments (Tags) that are connected by the cable:

- The nearest node to the equipment, which is where the cable enters the cableway
- Tara length, which is the length of (unrouted) cable from the tag to the cableway
- The tag name (equipment)
- The tag's location
- The tag's description

You can 'jump' to the node or to the equipment by clicking the . If the cable route is forced, you can see a list of nodes, that the route must pass.

Read about Nodes on page 24 and about Tags and Equipment on page 15.

If the cable has Glands at one or both ends, they are listed below each Node.

- You can also see how long the cable is, and depending on its status, you see: estimated, routed, routed + Tara, pulled and installed lengths, all in meters.
- Current correction factor (typed manually), current ratings and values are showed, too, and are based on the Cable specification.
- Second to last is a log of various messages, that users have typed about the cable. The latest remark or action is showed, other remarks can be seen when pressing the History button.
- At the bottom is a box with creation and update info.

The Status tab

On this tab, you see the status of the cable, who changed it and when the cable changed status. The History button might reveal more information, i.e. if the cable has been reset.

Main **Status** Route load Wiring Calculations

Standard

Created date	09/07/2015	ADMIN
Routed	10/05/2017	ADMIN
Released	Set	
Pulling card sent	Set	
Pulled	Set	
Termination card sent	Set	
Terminated from	Set	
Terminated to	Set	
Tested	Set	
Installed	Set	
Approved	Set	

Special

Suspended	Set	
Spared	Set	
Special	Set	
Defective	Set	
Pre-wired	Set	

History...

The Route load tab

Here you see a list of which nodes and segments the cable is routed on and details concerning that route, e.g. Cable Count, Segment Type, Length, Allowed and Used width etc.. You can 'jump' to a node or segment by double-clicking its name.

Main **Status** **Route load** Wiring Calculations

From Node	To Node	Segment	Cable Count	Type	Length [m]	Allowed Width [mm]	Used Width	Allowed Area [mm ²]	Used An
M1	M2	M1M2	7	CT1	8,50	-	-	42.000	2,3
M2	M3	M2M3	6	CT1	7,50	-	-	42.000	2,2
M3	M4	M3M4	6	TRANSIT1	1,00	-	-	175.000	1,4
M4	M6	M4M6	5	CT1	10,00	-	-	42.000	1,8
M6	M7	M6M7	3	CT1	13,00	-	-	42.000	1,0
M7	M8	M7M8	2	CT1	3,00	-	-	42.000	0,7

The Wiring tab

Here you can see how each cable conductor is connected to the Equipment terminals, if the terminals are defined.

Connections

From tag : **-MDP** To tag : **-SDP1**

Termrow	Termpoint	Conn.Point	Group	Color	Termrow	Termpoint	Conn.Point
X1	1		001	Blue/Light blue (BU)	X1	1	
X1	2		001	Brown (BN)	X1	2	
X1	3		001	Black (BK)	X1	3	
X1	4		001	Grey (GY)	X1	4	
X1	5		001	Green/yellow (GNYE)	X1	5	

Edit connections

The Calculations tab

The voltage drop calculations on the selected cable are found in this tab.


Read more about the calculations on page **Fejl! Bogmærke er ikke defineret..**

If the voltage drop exceeds the allowed percentage (set in Settings), the field becomes red on this page.

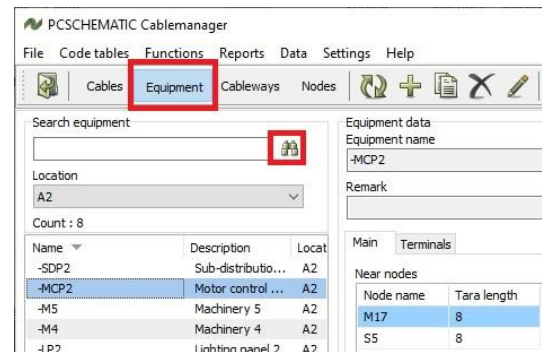
Main	Status	Route load	Wiring	Calculations		
Phases 1 - Phase						
U - Voltage [V] 230		I - Current [A] 5		L - Length [m] 67,5		
R20 - Resistance [Ω/km] 4,61		X20 - Reactance [Ω/km] 0,099		Temperature coefficient 0,004		
Power [W] 1035						
Start / Normal						
<input type="radio"/> Start	SF - Start factor 0	I - Current [A] 0	cos(φ) 0	Voltage drop 0	Voltage drop % 0	Max voltage drop 20 %
<input checked="" type="radio"/> Normal		5	0,9	1,471	1,28	2 %
Voltage drop						
$R = R20 * (1 + \alpha * (t - 20)) = 4,61 * (1 + 0,004 * (30 - 20)) = 4,79 \Omega/\text{km}$						
$X = X20 * (1 + \alpha * (t - 20)) = 0,1 * (1 + 0,004 * (30 - 20)) = 0,1 \Omega/\text{km}$						
$VD = \frac{I * L * (R * \cos(\varphi) + X * \sin(\varphi))}{1000} = \frac{5 * 67,5 * (4,79 * 0,9 + 0,1 * 0,44)}{1000} = 1,471 \text{ V}$						
$VD\% = \frac{2 * VD * 100\%}{U} = \frac{2 * 1,471 * 100\%}{230} = 1,28 \%$						
					Voltage at endpoint [V] 228,529	



Equipment

Load all Equipment by clicking the show  button. Search by typing a text in the search window or use the Location filter before clicking show.

When Equipment is loaded, the left side of the window will show a list of equipment and the right, details of the selected equipment.



The top part

Select an equipment in the list to the left to see all data for it. The top part of the window shows the basic equipment data:

- Equipment name and description
- Location
- Remarks, if any
- Project, Contractor, Discipline and/or System codes

In case there are attached documents to the equipment, open them by clicking the clip beside the cable name. Clip looks like the cable clip on page 11 in case there are attached documents.

Equipment data	
Equipment name	Description
-LP2	Lighting panel 2
Location	A2
Remark	
Project	Contractor
Discipline	System

The lower part

The lower part is divided into two tabs: a Main tab and a Terminals tab.

The Main tab

The lower part of the window shows – for each equipment – its closest node(s) and the Tara length (length of unrouted cable from the node to the cableway).

It also shows a list of the cables connected to the node, as well as their status, their segregations and their node.

And at the bottom of the tab are info of when and who made the last changes.

Node name	Tara length
M17	8
S5	8

Cable name	Status	Segregation	Node name
-W23	ROU	S	S5
-W24	ROU	S	S5
-W6	ROU	M	M17

Created date: Created by: Updated date: 10/05/2017 10.18.05 Updated by: ADMIN

The Terminals tab


The Terminals tab shows the Equipment's terminal rows – if any – and the cable connections to them – if connected. And again when it last was changed and by whom.

Row : terminal : connection	Cable : group : wire
X1 : 1 :	-W1 : 001 : 1
X1 : 2 :	-W1 : 001 : 2
X1 : 3 :	-W1 : 001 : 3
X1 : 4 :	-W1 : 001 : 4
X1 : 5 :	-W1 : 001 : 5

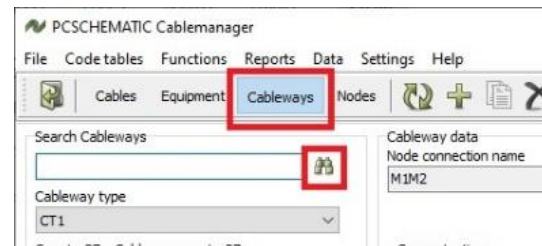
Created date: Created by: Updated date: 14/06/2016 11.30.32 Updated by: ADMIN



Cableways

Load cableways by pressing the show  button

Search by typing a text in the search window or use the Cableway type filter, and then press the Show button.




The top part

Select a cableway in the list to the left to see all data for it.


The top part of the window shows the the basic cableway data:

- Node connection name and its description
- The FROM node's coordinates and location
- The TO node's coordinates and location
- The calculated length based on coordinates
- An arrow showing the direction

Cableway data	
Node connection name	Description
K1-K2	Test cableway

Connection					
From Node	Location	To Node	Location	Calc. distance [m]	Direction: Diagonal (Up) 
K1	A3	K2	A3	15,00	
Position:		Position:		Dif:	
X: 5,00		X: 15,00		X: 10,00	
Y: 5,00		Y: 15,00		Y: 10,00	
Z: 5,00		Z: 10,00		Z: 5,00	

[Split...](#)

Use the 'jump'  arrows to go to the Node at either end.

The lower part

The lower part is divided into different tabs: Load tab and Cables tab.

The Load tab

In the Load tab you can see a list of all cableways and their loads between the two nodes:

- The cableway(s) on the Node connection
 - There can be more parallel cableways between two nodes
 - If the cableways are parallel, you can see the offset – here they are in different heights: Z: 0,5 and Z:1
- The cableway type for each cableway
 - Cableways can physically be cabletrays, ladders etc
- The segment(s) on each cableway
 - Data about the segment

Load											
Cables											
	Type	Segregation	Cable Count	Used Area/Width	Installation Method	Fill Factor	Available Area/Width	Allowed Area/Width	Length [m]	Offset from [m]	Offset to [m]
Cableway 1	CT1						150x400 mm ²		15	Z:1	Z:1
Segment CW1 - 1		T	0	0 %	Area	1,00	200 mm (50%)	30.000 mm ²			
Segment CW1 - 2		M	0	0 %	Area	1,00	100 mm (25%)	15.000 mm ²			
Segment CW1 - 3		S	0	0 %	Area	1,00	100 mm (25%)	15.000 mm ²			
Cableway 2	CT1						150x400 mm ²		15	Z:0,5	Z:0,5
Segment - new name		T	0	0 %	Area	1,00	400 mm (100%)	60.000 mm ²			
Cableway 3	CT1						150x400 mm ²		15	-	-
Segment		T	0	0 %	Area	1,00	400 mm (100%)	60.000 mm ²			

The Cables tab

On the Cables tab, you can see the cables and data on the cables running on the selected node connection.


Here, there is only one cableway with one segment; if you have more cableways and/or more segments, you can fold or unfold the groups for better overview.

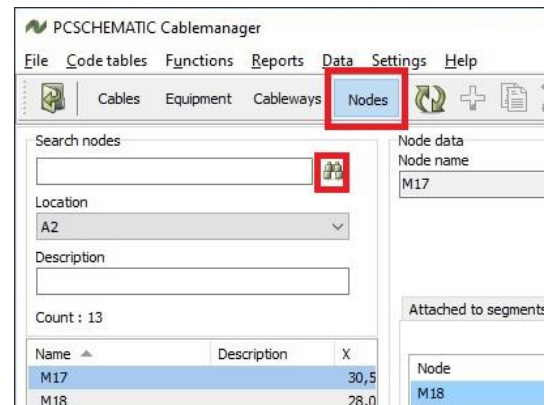
Load									
Cables									
Cable name	Type	Segr...	Status	Dia [mm]	Cross Section [mm ²]	Correction Factor	Current Rating [A]	Curr [A]	Max Curr [A]
[-] Cableway 1									
[-] Segment		M							
[-W1	5G4		PSS	12,00	4,00	1,00	42,00	5,00	42,00
[-W7	3G1,5		ROU	8,50	1,50	1,00	18,50	0,00	18,50
[-W5	5G4		PW	12,00	4,00	1,00	42,00	0,00	42,00
[-W6	5G4		ROU	12,00	4,00	1,00	42,00	0,00	42,00

You can jump to any cable, by double-clicking on it in the list.



Nodes

Load nodes by pressing the show button 
 Search by typing a text in the search window or use the Location filter, and then press the Show button.



The top part

Select a node in the list to the left to see all data for it.
 The top part of the window shows the basic node data:

- The Node name and a description
- The Node's locations
- And most important: the Node's coordinates

The lower part

The lower part is divided into two different tabs: Attached to segments and Attached to nodes.

The Attached to segments tab

Here you can see which segments that are attached to the selected node. Double-click on a selected one to jump directly to it.ⁱⁱ

Attached to segments						
Node connectio	From node	To node	Offset from	Offset to	Cableway type	Segment name
K1-K2	K1	K2	Z:0,5	Z:0,5	CT1	Segment
K1-K2	K1	K2	Z:1	Z:1	CT1	Segment - new
K1-K2	K1	K2	Z:1	Z:1	CT1	Segment CW1 -
K1-K2	K1	K2	Z:1	Z:1	CT1	Segment CW1 -

The Attached to nodes tab

On the tab, you can see a list of the nodes, that are attached to the selected node. If you double-click on one of them, you jump directly to it.

Attached to nodes	
Node	
K2	

CREATE AND EDIT PARTS

In this chapter you can see, how you create and edit parts in the project. Some functions can only be carried out by users with the right user profiles. Read more from page 56.

In order to get a better understanding of the relations between parts, there is a short overview below of the program's data structure.

Overall data structure in the Cablemanager

The program contains data for Cables, Equipment, Cableways (Segments and Nodes) and it ties this data together.

The program can route the Cables on Cableways, and in this way ties all this data together and based on routing, it generates Cable lengths and reports for installation, and keeps track of all cables' statuses.

The main data is created and maintained in the main tables.

In order to do so, certain data is needed, e.g. cable type, cableway type etc. and less essential information about locations, contractors etc. can also be added. This data is created and maintained in the code tables.

Overall workflow when making a project

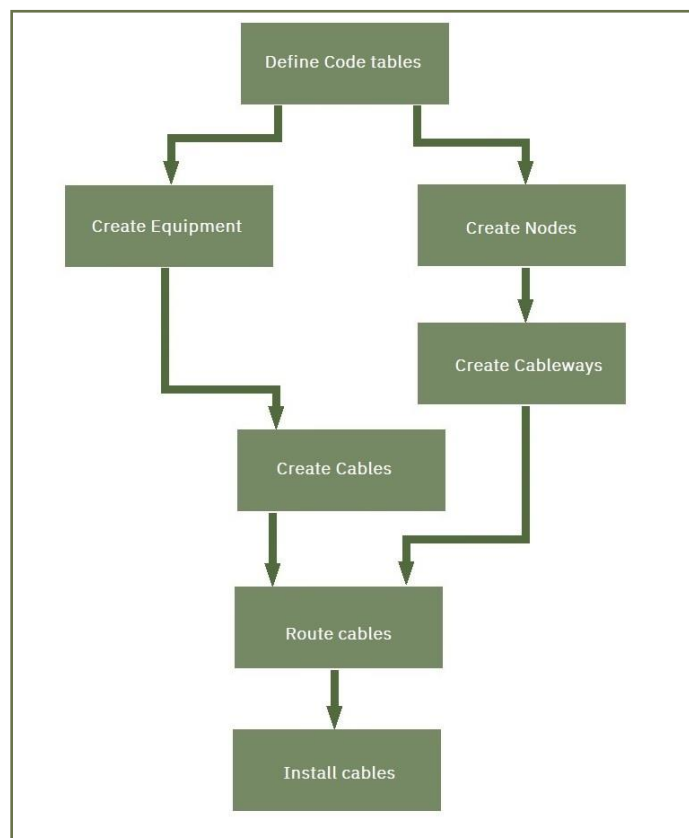
The overall workflow when starting a project follows this figure.

This part of the manual deals with the data structure – where you can find what type data – and how you can change the data to fit your project, either manually or by importing data.

There are sections concerning:

- The Code tables and their data
- How to create data for the main tables (Equipment, Cableways, Cables)
- How to import data from other systems.

You will also find sections that explain concepts and definitions.



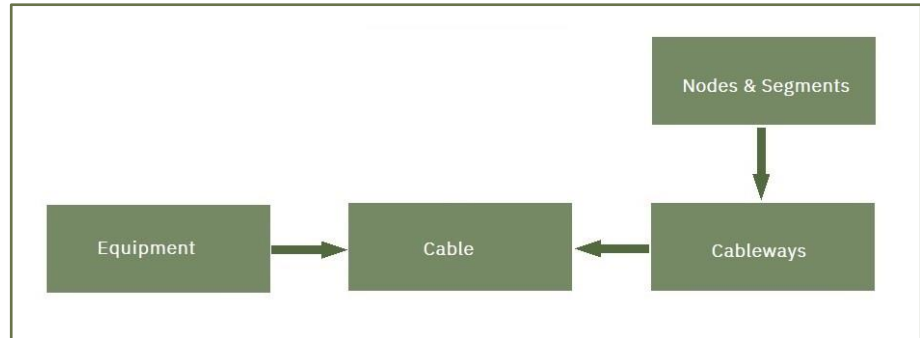
The code tables

All basic data about e.g. cable types, cableway types, structuring etc. is based on data in the codes tables.

You can read more about the code tables in the Data structure & Import function manual.

The main tables

All Cablemanager data is stored in a database. The database structure is based on the cables and the equipment that is connected through them. The program



can route the cable and suggests all possible routes. The route that the cables follow is essential for the design of the project, as it decides the length of the cable and thereby the voltage drop. Furthermore, a current correction factor needs to be applied (manually) if there are parallel cables. The program can't do any advanced calculations for cable dimensioning.

Cables

Cables connect equipment. Cables can be created in the program (or imported from files). Cables contain data about the cable type and the connected equipment.

Equipment

Equipment can be machinery, panels, lamps etc.. Equipment can be created (or imported from files). Equipment contain data about location and maybe connection terminals.

Cableways

Cables are running on cableways, which can be cable trays, cable ladders, cable tubes, cable fire transits etc.. All cableways are defined with Start and End nodes (from which the lengths are deducted) and eventually the routes on the cableway creates the cables' lengths.

Cableways are collections of Segments that start and begin with Nodes.

Segment & Nodes

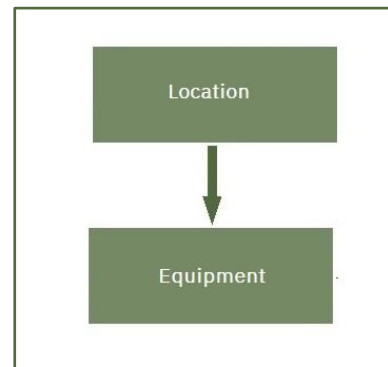
A segment is a part of a cableway. A segment has a segregation code for the installation type that runs in the segment, e.g. 400 kV. You can have more parallel segments on a cableway, one for each installation type.

All segments on the same cableway have the same Start and End nodes. A node is needed where a cableway changes direction and/or a cable can enter or leave. The nodes are named and have XYZ coordinates.

Create equipment

Equipment is panels, machinery, lamps etc. that is connected by cables.

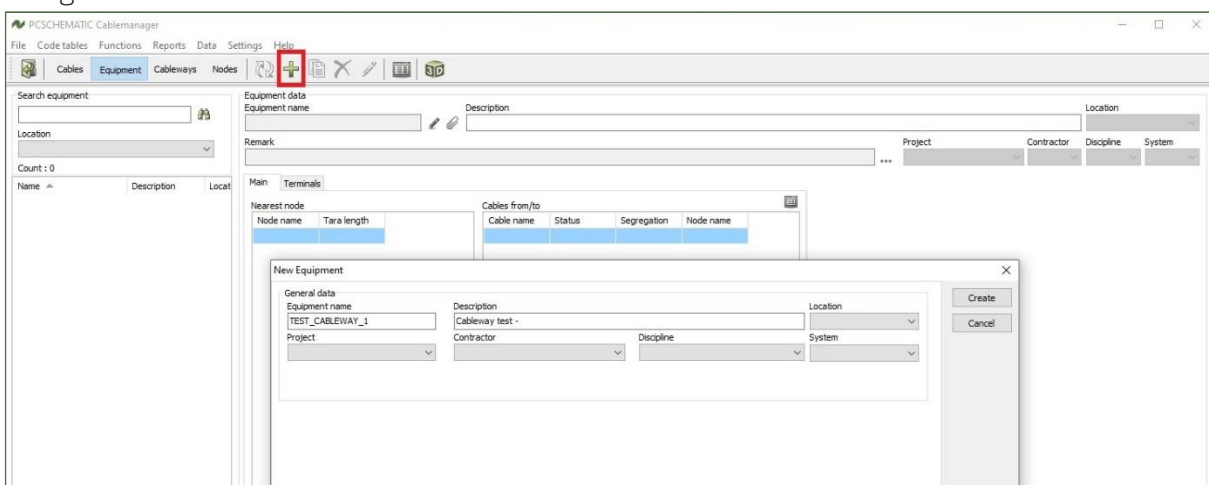
Before routing the cables, the equipment in both ends needs to be defined.




Create equipment directly in the program

Start creating equipment by pressing  while in the 'Equipment' tab.

This opens a dialog, in which is typed the name of the equipment – the tag no – and a description. It is optional to add structure designations and contractor codes during creation. Designations and codes can also be added later.







Edit equipment

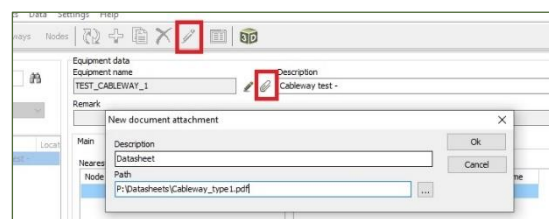
If you want to edit an existing piece of equipment in the project, you need to press the  in the top tool bar.

The name can be changed by using the pen beside the name. You can also change Description, Location, Project, Contractor, Discipline, System.

Attach documents

It is possible to attach documents to the equipment.

Start by selecting the  (you can only do this on existing equipment), then click the  next to 'equipment name'. When documents are attached the  changes to .



The main tab

The main tab shows the nearest nodes to the equipment. The Node names come from the Cables table's nearest node to equipment. See page 33 for more info. For each node, you can see the connected cables.

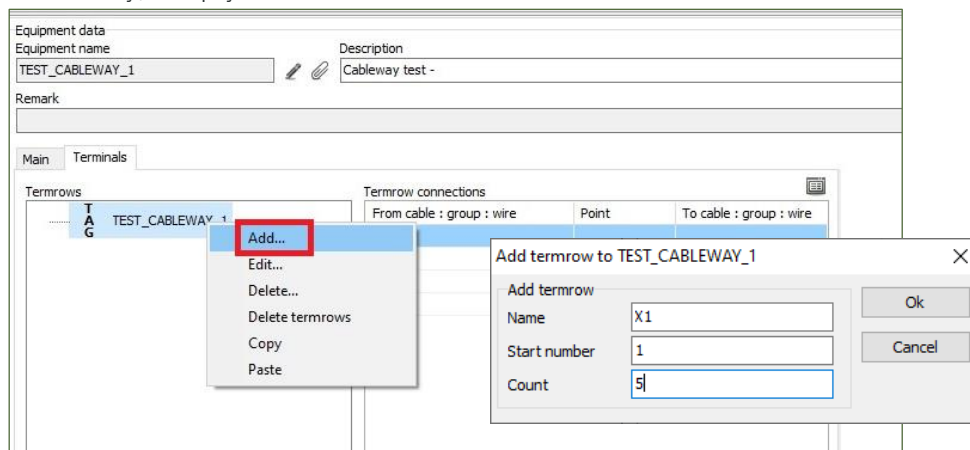
You can 'jump' to the connected cables and the nodes, but you can't edit information here.

Near nodes		Cables from/to			
Node name	Tara length	Cable name	Status	Segregation	Node name
M8	8	-W15	ROU	M	M9
M9	8	-W16	ROU	M	M9
		-W17	ROU	M	M9
		-W1	REL	M	M8

Create terminal rows on the equipment

Add terminal rows to equipment by right-clicking the present terminal row and clicking 'add...', then add 'name', 'start number' and 'count'.

Here, I have added terminal row X1, and terminals 1 to 5. If they should be named differently, simply edit the terminal row later.



Batch functions – Equipment

You can select a lot of equipment in this window. Use the filters to find the desired equipment, and Select all or some of them.

You can export the selected to Excel by clicking the button in the toolbar, or you can delete the selected ones by clicking the Action button.

Equipment batch action

General data

Equipment name

Description

Location

Project

Contractor

Discipline

System

Search

Clear all

Action ->

Cancel

Count : 8

Check all

Check none

Equipment Name	Description	Location Code	Project Code	System No	Discipline Code	Contractor No
<input checked="" type="checkbox"/> -E6	Light 6	A2				
<input checked="" type="checkbox"/> -E7	Light 7	A2				
<input checked="" type="checkbox"/> -E8	Light 8	A2				
<input checked="" type="checkbox"/> -LP2	Lighting panel 2	A2				
<input checked="" type="checkbox"/> -M4	Machinery 4	A2				
<input checked="" type="checkbox"/> -M5	Machinery 5	A2				
<input checked="" type="checkbox"/> -MCP2	Motor control panel 2	A2				
<input checked="" type="checkbox"/> -SDP2	Sub-distribution panel 2	A2				

Import and update equipment

You can import data for equipment from Excel-sheets.

Use the functions in Data|Import.

The equipment's name must be in the sheet, the other data is optional.

Generate Sheet - Insert - Equipment

Mandatory Columns

Field

Tag name

Optional Columns

Field

☐ Description

☐ Location code

☐ Project code

☐ Contractor code

☐ System no

☐ Discipline code

☐ Remark

☐ Show DB field names

All

None


< Back

Generate Sheet

Close

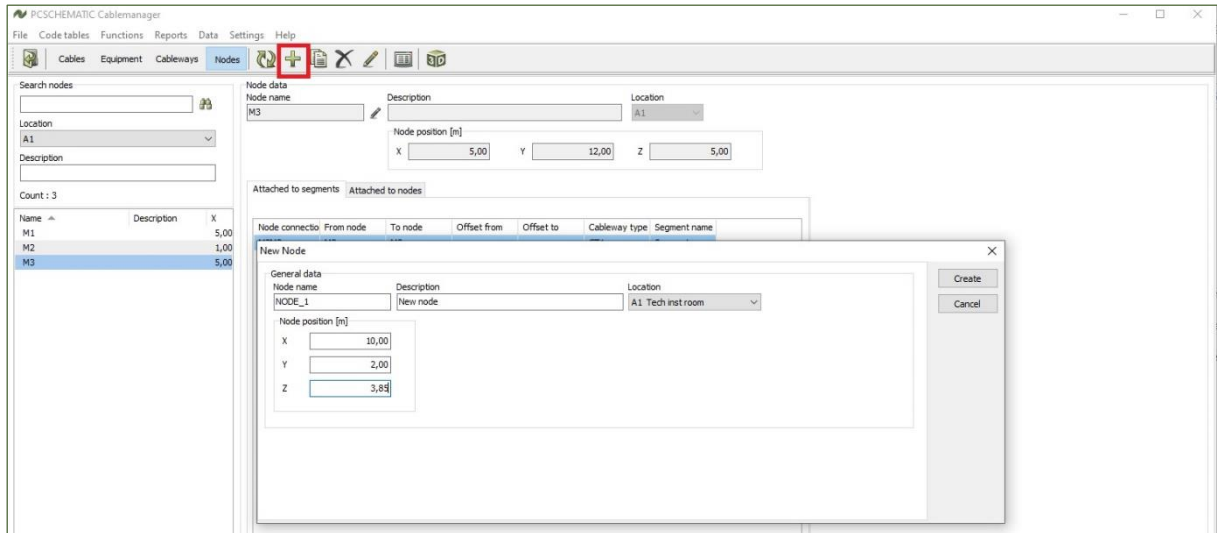


Create nodes


Start creating nodes by pressing  in the toolbar while in the 'Nodes'-menu.

This opens a dialog, which requests a node name and XYZ coordinates. Description and location is optional.

Nodes are necessary every time a cableway changes direction. Based on the coordinates, the program calculates Cableway lengths and hence cable lengths.



Edit nodes

If you want to edit an existing node, you need to press the  in the top tool bar.

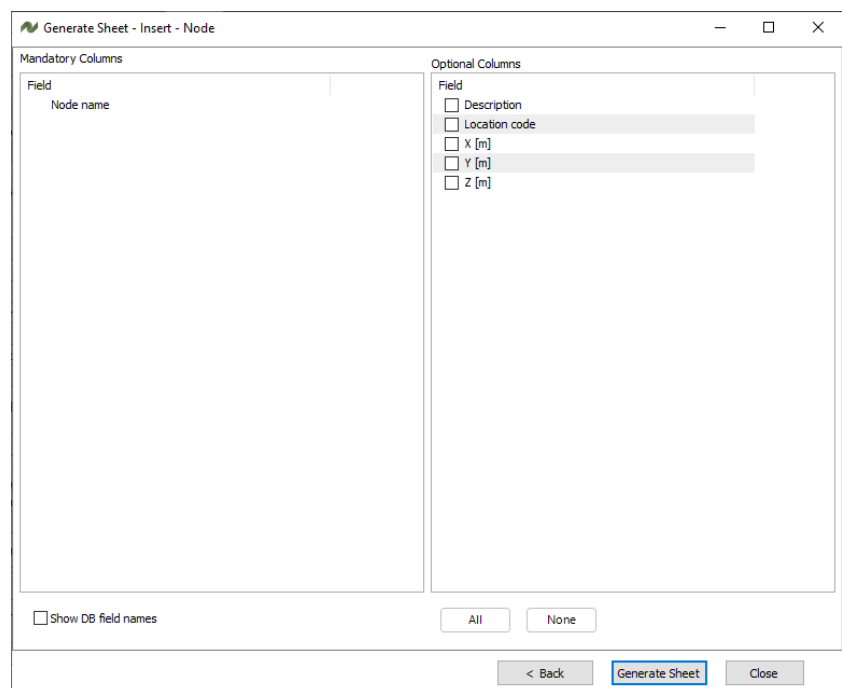
The name can be changed by using the pen beside the name. You can also change Description, Location and the node's coordinates.

Import and update nodes

You can also use the Import function for importing and/or updating a lot of nodes in one operation.

With the Data|Import function, you can import a list of nodes in one operation.

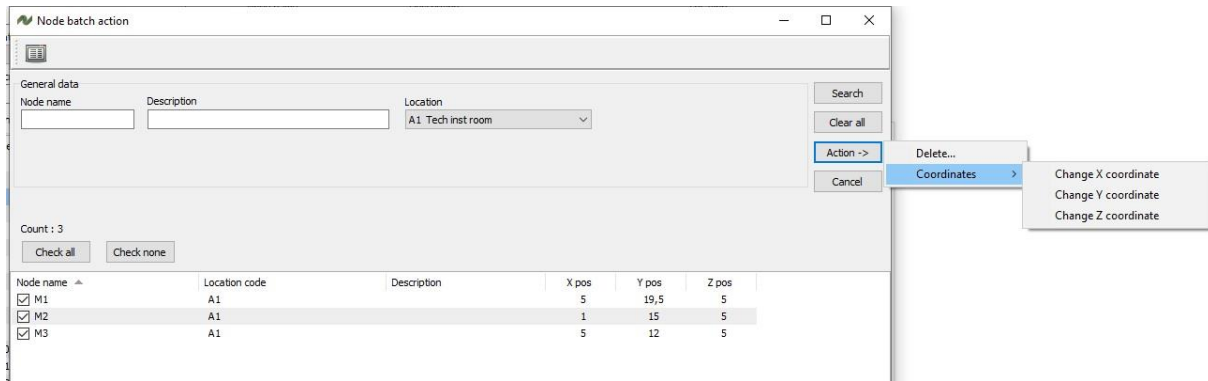
It is also possible to update existing node with the Update function.



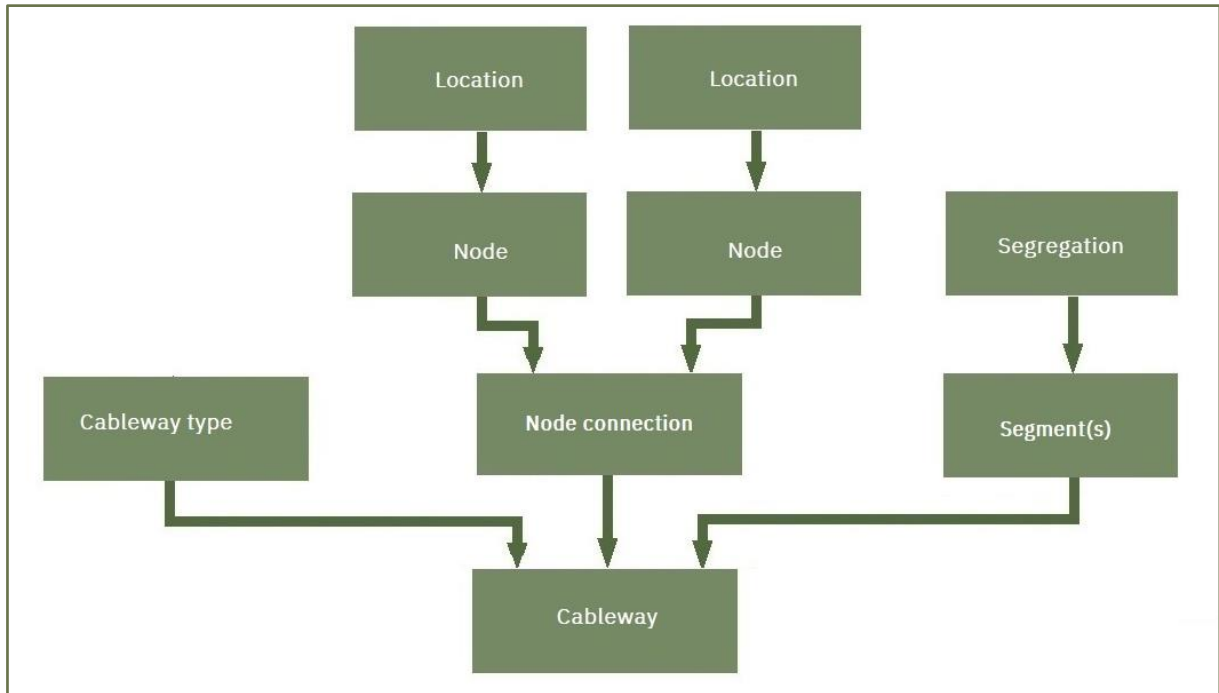
Batch function – Nodes

There are Node batch functions that let you edit many nodes in one operation:

- One function is to make a selection and delete the selected.
- Another batch function allows you to change coordinates on a selection of nodes.




Create Cableways



Before creating Cableways, some information is needed, as shown in the figure:

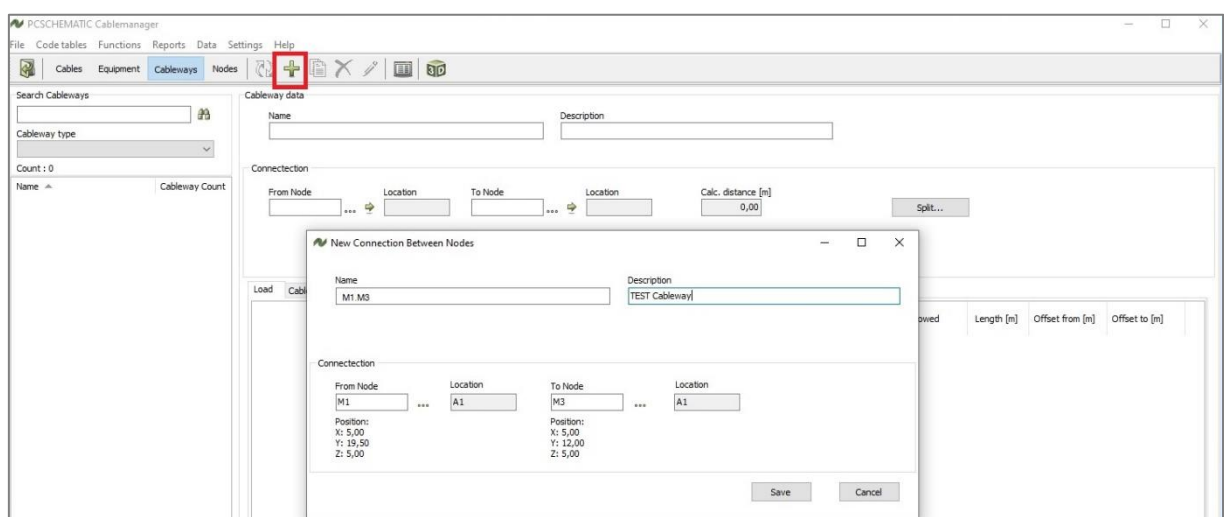
- Cableway types from the code tables
- The nodes – coordinates for cableways' change of directions
- Segregations (to create the segments on the cableway)

Create a new Cableway

Start the process by pressing the  in the top toolbar. A Cableway consists of a Node connection, with one or more Cableways, that each have one or more Segments.

First you create the Node connection:


Select the two nodes that are at the ends of the Cableway. The Node connection is named automatically after the two nodes – if selected in the Settings – and you can give it a description. If you select two nodes, that already have a connection between them, you get a warning and you can't save it.



When the Node connection is saved, you have to add a Cableway type, that you select from the list.

Finally you add Segment data the Cableway. Segments are the traces in the physical Cableway, so you need to give it a Segregation code.

All Cableways must have at least one Segment on it, so default, the width is set to 100% of the Cableway type.

 New Cableway

Position

The cableway runs

From node

M1

To node

M3

Node positions [m]

From node

X

5,00

To node

X

5,00

Y

19,50

Y

12,00

Z

5,00

Z

5,00

Offset for cableway [m]

From node

X

0,00

To node

X

0,00

Y

0,00

Y

0,00

Z

0,00

Z

0,00

Cableway absolute position [m]

From node

X

5,00

To node

X

5,00

Y

19,50

Y

12,00

Z

5,00

Z

5,00

Cableway data

Cableway type

CT1

Weight Factor

1,000

Length [m]

7,50

Shape of cableway: Height and width

Segment data

Name

Segment

Segregation

M 440V OR BELOW

Installation Method

Area

Fill Factor

1,000

Segment Width

100,0 %

400,0 mm

Description

Shape of cableway: Height and width

Size: 150x400mm²

Width for segments in cableway

Available Width	Width of other Segments	Cableway Width
100 %	0 %	100 %
400 mm	0 mm	400 mm

Save

Cancel



Edit a Cableway

You have the following options to edit Cableways:

Change the cableway length

If selected so in Settings, the length is automatically calculated as the distance between the connected nodes. That means, that if the length is wrong, it must be because the nodes' coordinated are wrong. Change them, and Update the cableway.ⁱⁱⁱ

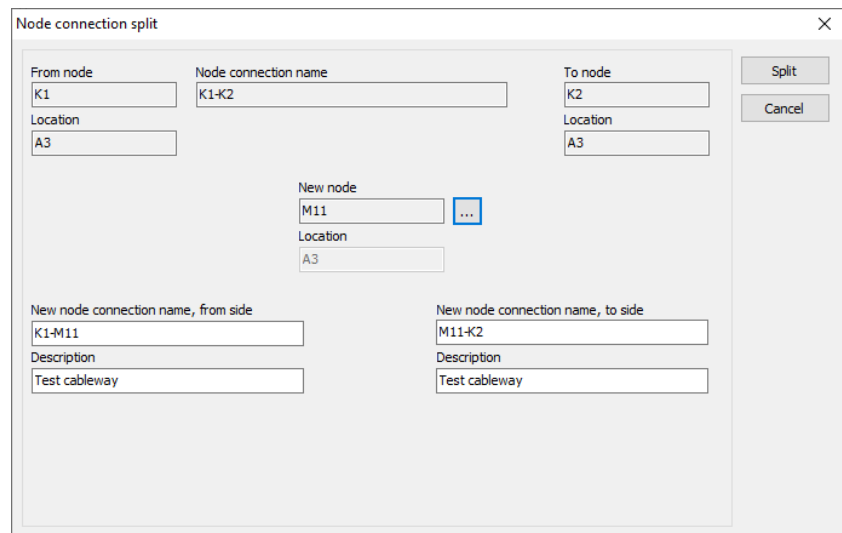
Split cableway

The system needs nodes at all positions where a cable can change direction. So if you add new change of direction in the system, you might need to split a Node connection.

Press the Split button, and you can split the existing Node connection into two new ones.

If automatic naming is selected in Settings, it also works here.

Cables already on the 'old' cableway, will automatically be on the 'new' cableways.



The 'Node connection split' dialog box is used to split an existing node connection. It contains the following fields:

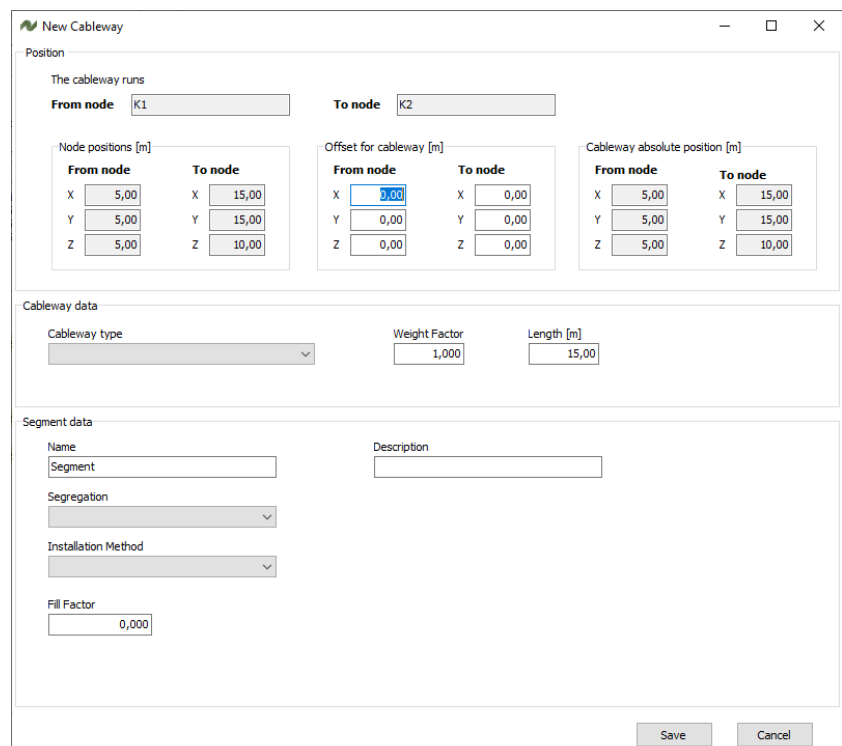
- From node:** K1
- Node connection name:** K1-K2
- To node:** K2
- Location:** A3
- New node:** M11 (with a blue selection button)
- Location:** A3
- New node connection name, from side:** K1-M11
- New node connection name, to side:** M11-K2
- Description:** Test cableway

Buttons: Split, Cancel

Add parallel cableways

You can add parallel cableways by pressing the Add Cableway button. When in this window, simply type the offset values for the new Cableway, and then select its Cableway type and Segment(s).

See also the picture on next page.



The 'New Cableway' dialog box is used to create a new cableway. It contains the following sections:

- Position:**
 - The cableway runs:** From node: K1, To node: K2
 - Node positions [m]:**

	From node	To node
X	5,00	15,00
Y	5,00	15,00
Z	5,00	10,00
 - Offset for cableway [m]:**

	From node	To node
X	0,00	0,00
Y	0,00	0,00
Z	0,00	0,00
 - Cableway absolute position [m]:**

	From node	To node
X	5,00	15,00
Y	5,00	15,00
Z	5,00	10,00
- Cableway data:**
 - Cableway type:** (dropdown menu)
 - Weight Factor:** 1,000
 - Length [m]:** 15,00
- Segment data:**
 - Name:** Segment
 - Description:** (text field)
 - Segregation:** (dropdown menu)
 - Installation Method:** (dropdown menu)
 - Fill Factor:** 0,000

Buttons: Save, Cancel

Add Segment

When you create the Cableway, you also add one segment to it. By default, the segment fills out 100% of the Cableway width. You can change that when you create the cableway, or you can change it later:

LoadCables

	Type	Segregation	Cable Count	Used Area/Width	Installation Method	Fill Factor	Available Area/Width	Allowed Area/Width	Length [m]	Offset from [m]	Offset to [m]
Cableway 1	CT1						150x400 mm²		22,91	Z:1	Z:1
Segment CW1 - 1		T	0	0 %	Area	1,00	200 mm (50%)	30.000 mm²			
Segment CW1 - 2		M	0	0 %	Area	1,00	100 mm (25%)	15.000 mm²			
Segment CW1 - 3		S	0	0 %	Area	1,00	100 mm (25%)	15.000 mm²			
Cableway 2	CT1						150x400 mm²		22,91	Z:0,5	Z:0,5
Segment - new...		T	0	0 %	Area	1,00	400 mm (100%)	60.000 mm²			
Cableway 3	CT1						150x400 mm²		22,91	-	-
Segment		T	0	0 %	Area	1,00	400 mm (100%)	60.000 mm²			

Delete

Add CableWay

Add Segment

Edit

Select the Segment, you want to change and press the Edit button.

Then change the percentage of the first segment, ie to 50 %.

Save, and then you can add more segments, for the last 50%,

Segment

Segment data

Name

Segment

Segregation

T TEST LEVEL

Installation Method

Area

Fill Factor

1,000

Segment Width

50 %

200,0 mm

Description

Shape of cableway: Height and width

Size: 150x400mm²

Width for segments in cableway

Available Width	Width of other Segments	Cableway Width
100 %	0 %	100 %
400 mm	0 mm	400 mm

Save

Cancel

Import and update Cableways

You can also use the Import function for importing and/or updating a lot of cableways one operation.

Generate Sheet - Update - Cableway/Segment

Mandatory Columns

Field

ID (for internal use)

From node

To node

Offset From X [m]

Offset From Y [m]

Offset From Z [m]

Offset To X [m]

Offset To Y [m]

Offset To Z [m]

Optional Columns

Field

☐ Node connection name

☐ Length [m]

☐ Cableway type

☐ Max. weight factor

☐ Segment name

☐ Description

☐ Cableway fill pct

☐ Segregation code

☐ Reference installation method

☐ Max. fill factor

☐ Show DB field names

All

None

< Back

Next >

Close



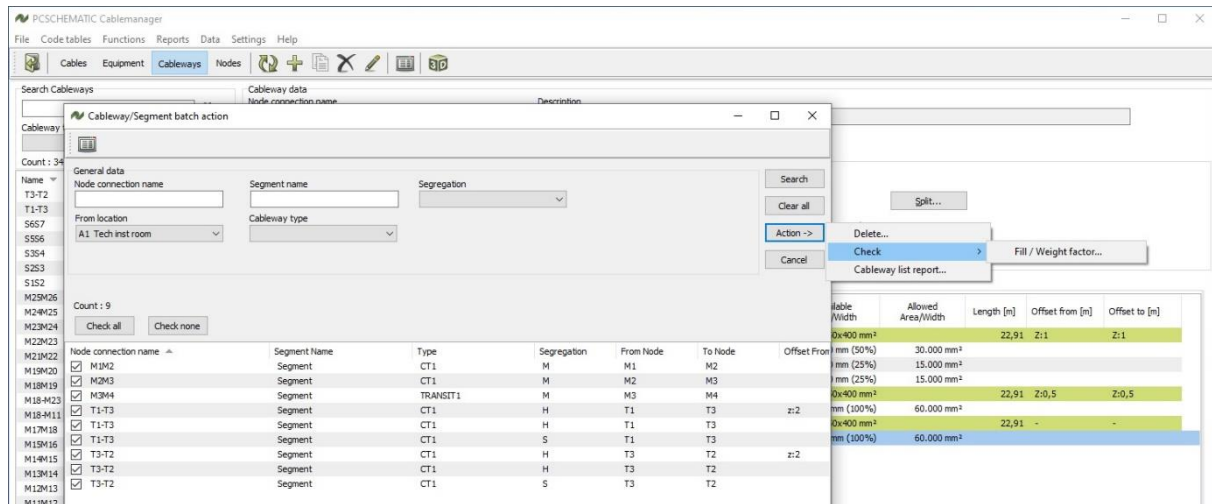
Batch function – Cableways

The Cableway batch functions are:

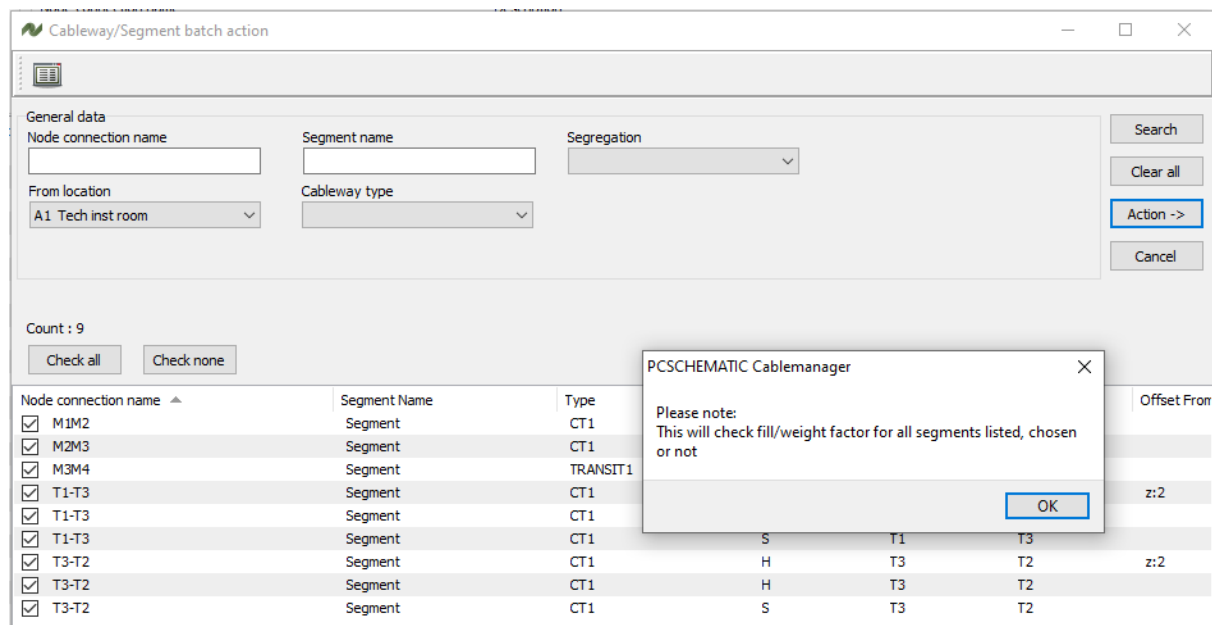
- Delete a selection of Cableways in one operation
- Check Fill/Weight factors on a selection of Cableways
- Make a Cableway list report

Make a selection, based on free text, location, cableway type and/or segregation. And select/deselect to get the right selection.

You can delete the selected.



You can check fill and weight factors for the selected cableways:

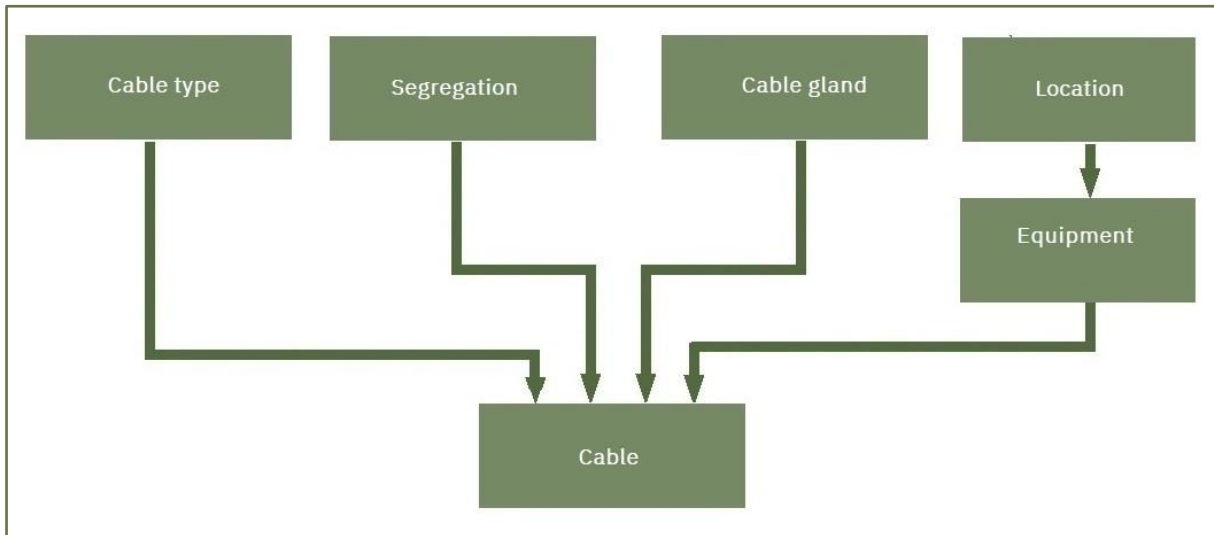


You can make a Cableway list report, that generates a pdf-file, that shows the data for the selected cableways as seen below.

Project no: Project name:		Cable Tray / Ladder Installation Location: A1 Tech inst room					Revision: Init.: ADMIN Date: 06/07/2020	
Node connection:	Description:	Cableway:	Segment name:	Cableway type:	No. of Cables:	Fill:	Length (m):	Direction:
M1M2		Cableway 1	Segment	CT1	4	1,2%	6,02	Horizontal
M2M3		Cableway 1	Segment	CT1	3	1%	5	Horizontal
M3M4		Cableway 1	Segment	TRANSIT1	3	0,7%	1	Horizontal
T1-T3		Cableway 1	Segment	CT1	0	0%	2,24	Diagonal
		Cableway 2	Segment	CT1	0	0%	2,24	Diagonal
			Segment	CT1	0	0%	2,24	Diagonal
T3-T2		Cableway 1	Segment	CT1	0	0%	3,16	Diagonal
		Cableway 2	Segment	CT1	0	0%	3,16	Diagonal
			Segment	CT1	0	0%	3,16	Diagonal




Create Cables



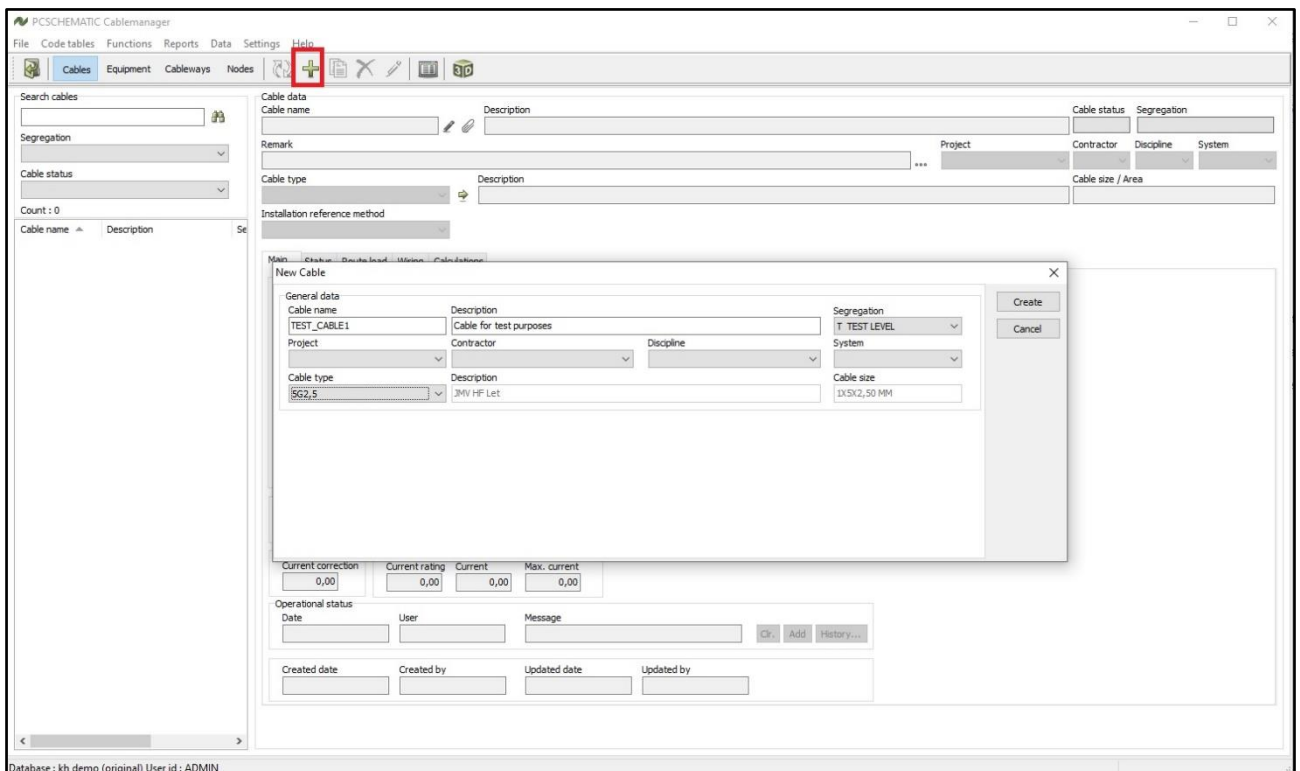
When you create Cables, all specifications and other basic data must be available before you can create the cable.

The figure above illustrates the overall workflow of cable creation, while the process is explained below.

Create a cable directly in the project

Create a new cable in the project by pressing the  in the main toolbar in the Cables menu. This opens a dialog asking for relevant information. The name, segregation and cable type must be selected. All other data is optional.

Finish the creation by pressing the 'Create' button. The cable is automatically given the status CR – Created (on the Status Tab) See all cable status codes on page 35.



The Man tab

When the cable has been created, determine and select the Equipment (Tags), Nearest Node, Tara length, possible Glands in both ends of the cable. ^{iv}

When this data is present, the cable can be routed and 'used' by a Normal user.

Cable data
Cable name: TTT
Description: Cable for test purposes
Cable status: CR
Segregation: H 1KV OR ABOVE
Remark:
Project:
Contractor:
Discipline:
System: 00
Cable type: 5G2,5
Description: JMV HF Let
Cable size / Area: 1x5x2,50 mm² / 9,8x9,8 = 96 mm²
Installation reference method: All
Cable is not routed

Main | Status | Route load | Wiring | Calculations

From
Node: M10
Tag: -M1
Location: A3
Description: Machinery 1
Cable Gland Type: 111 Size: 2L
Tara length [m]: 2,00

To
Node: M13
Tag: -M2
Location: A3
Description: Machinery 2
Cable Gland Type: Size:
Tara length [m]: 3,00

Via nodes
M11
M12

Cable lengths [m]
Maximum: 0,00 Estimated: 0,00 Routed: 0,00 Routed + Tara: 5,00 Pulled: 0,00 Installed: 0,00

Correction factor
Current correction: 1,00
Current [A]
Current rating: 24,00 Current: 0,00 Max. current: 24,00

Operational status
Date: User: Message:
Clr. Add History...

Created date: 30/06/2020 09:40:37 Created by: ADMIN
Updated date: 30/06/2020 09:49:11 Updated by: ADMIN

Save Cancel

Import and update Cables

You can also use the Import function for importing and/or updating a lot of cables in one operation.

You have the following data, that you can import here.

Generate Sheet - Update - Cable

Mandatory Columns

Field
ID (for internal use)
Cable name

Optional Columns

Field
<input type="checkbox"/> Reference installation method
<input type="checkbox"/> Segregation code
<input type="checkbox"/> Cable type
<input type="checkbox"/> From tag
<input type="checkbox"/> To tag
<input type="checkbox"/> From node
<input type="checkbox"/> To node
<input type="checkbox"/> From gland seq. no.
<input type="checkbox"/> To gland seq. no.
<input type="checkbox"/> Connection remark
<input type="checkbox"/> Phases
<input type="checkbox"/> From tara length [m]
<input type="checkbox"/> To tara length [m]
<input type="checkbox"/> Max. length [m]
<input type="checkbox"/> Estimated length [m]
<input type="checkbox"/> Installed length [m]
<input type="checkbox"/> Power factor (cosp)
<input type="checkbox"/> Voltage [V]
<input type="checkbox"/> Current [A]
<input type="checkbox"/> Max. voltage drop [%]
<input type="checkbox"/> Current correction factor
<input type="checkbox"/> Start power factor (cosp)
<input type="checkbox"/> Start current factor
<input type="checkbox"/> Max. start voltage drop [%]
<input type="checkbox"/> Description
<input type="checkbox"/> Project code
<input type="checkbox"/> Contractor code
<input type="checkbox"/> System no
<input type="checkbox"/> Discipline code
<input type="checkbox"/> Remark

☐ Show DB field names

All None

< Back Next > Close



Cable status codes

The cable status codes are fixed, and shown only for clarification. You find them on the Status tab of a cable.

The codes are used throughout the project when a cable changes status, and are used to filter through the cables in the project.

Some statuses are set automatically, e.g. when you make a Pulling report the status is (or rather, can be) changed to PSS. Other statuses require manual input, which again might be done with batch operations.

Code	Description
CR *	Created date. The cable was created or imported on this date (DD/MM/YYYY)
ROU *	Routed. The cable's route on the cableways has been found and approved.
REL	Released. Released for production, that is that pullings cards can be made.
PSS *	Pulling Card sent. Pulling card has info about TO/FROM, length and route.
PULL	Pulled. The cable has been pulled, and this is noted in the project.
TSS *	Termination card sent. Terminal card has info about termination on term.rows.
TF	Terminated FROM. Info from returned termination card.
TT	Terminated TO. Info from returned termination card.
TFT	Terminated FROM and TO. Info from returned termination card.
TST	Test. Cable is tested
INST	Installed. The cable is installed.
APP	Approved. The connection is ok.
SUS	Suspended. The connection is not ok.
SPA	Spare ^{vi} . The cable is not used.
SPC	Special. User defined special status
DEF	Defective. The cable is defect
PW	Pre-wired

* Date is (normally) set automatically by the system. ^{vi}

Route one cable

When you create a cable, you select the two pieces of equipment that are connected by the cable, and you select the two nodes, that are closest to the equipment.

You can then route the cable. The cable is routed on a Segment with the right Segregation code and the right reference installation method, as long as there is sufficient space for it.

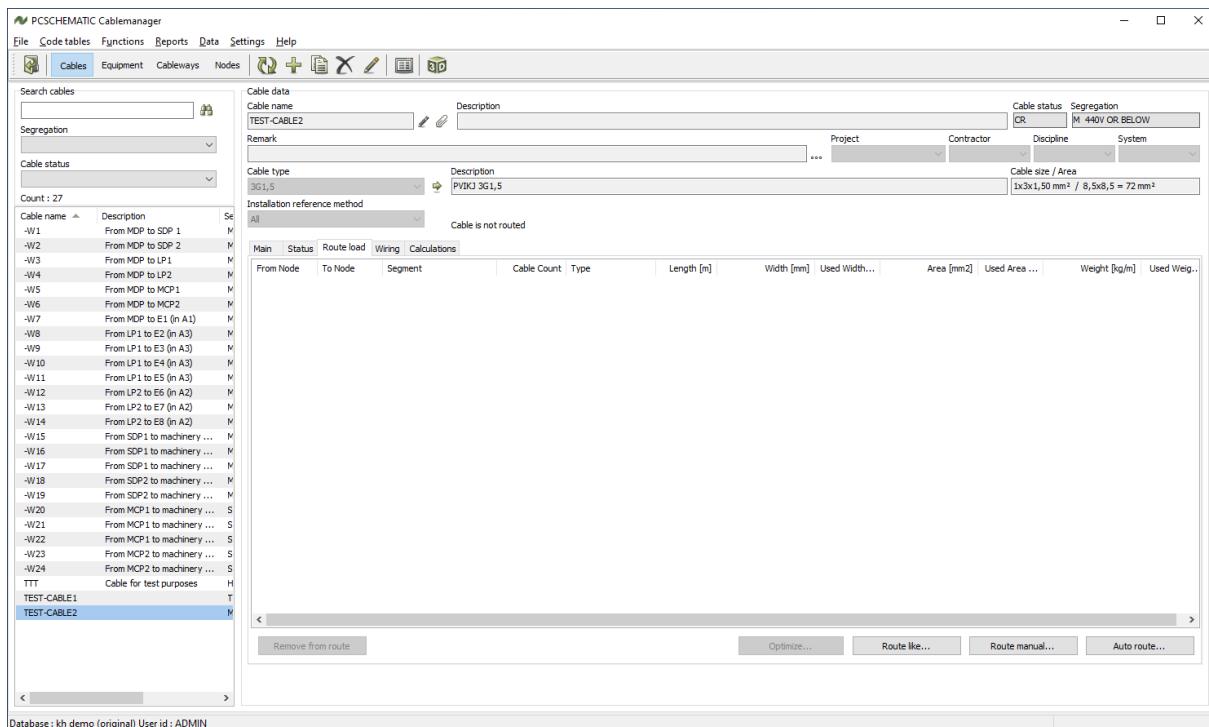
Go to the Route Load tab.

Here you can route the cable in three different ways:

- Route like ...
- Route manual ...
- Auto route ...
- Optimize ...

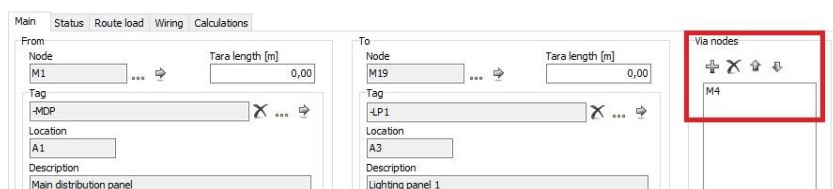
And remove the cable from the route (as long as it isn't pulled).

Remember, that when the cable was created, you could select the cable's installation method (read more about installation methods in Part 3 (Data structure and import functions) of the manual). Also remember, that the Segments on the Cableways were created with ref. installation methods, and that valid cable paths also depend on selected installation methods.



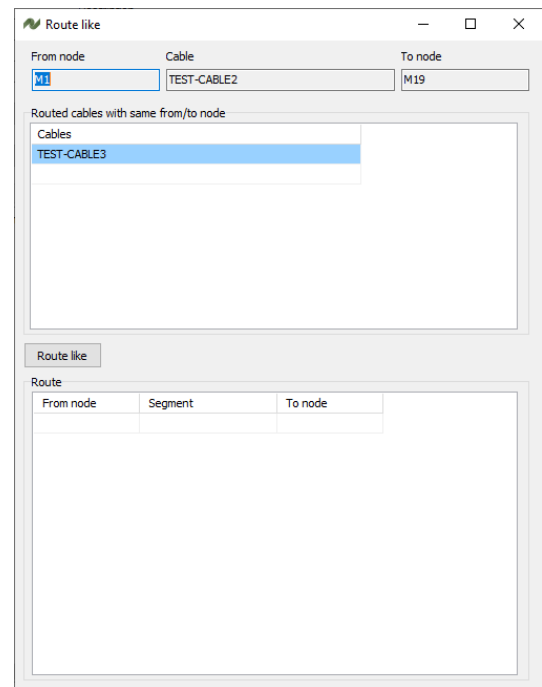
Force the cable route

On the main tab, you can force the cable route by selecting one or more Via nodes.



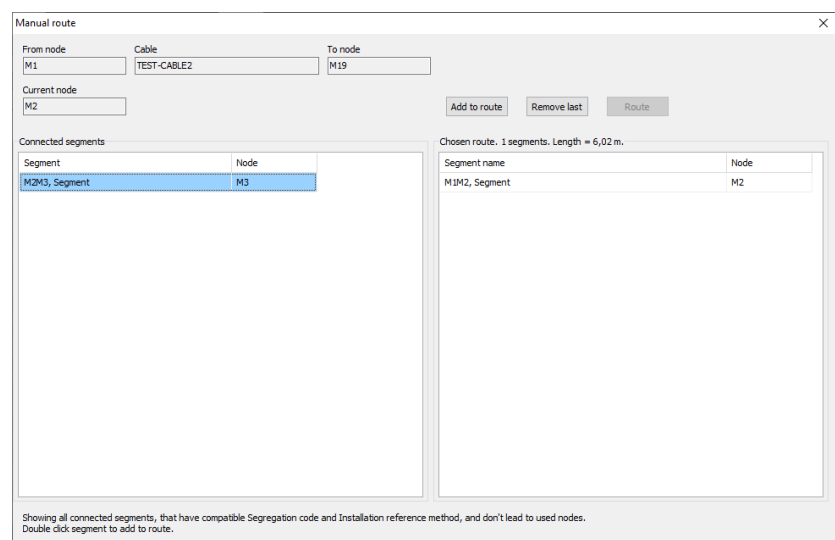
Route like ...

If you have other cables on the same route or part of the route.



Route manual ...

You can decide the cable's route totally manually. The possible segments come up when they are selectable, meaning that you can only select one segment at a time, and not the full route at once.

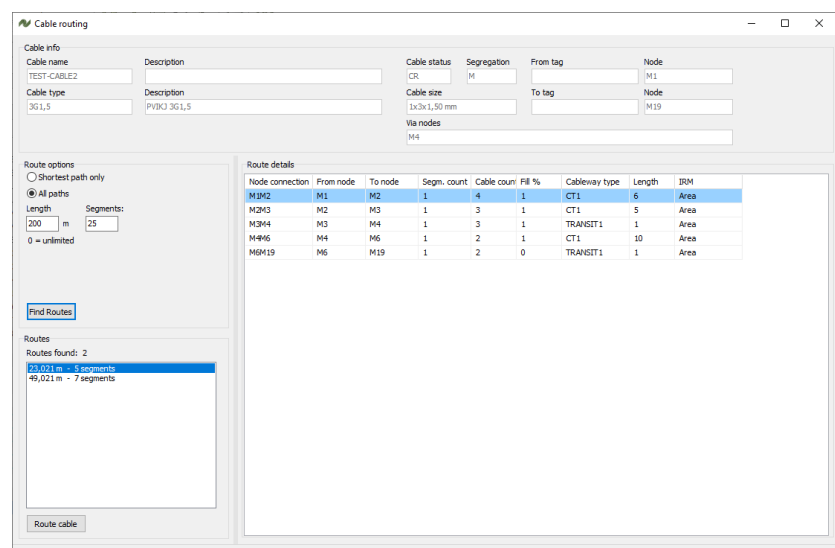


Auto route ...

The easiest method the Auto route function.

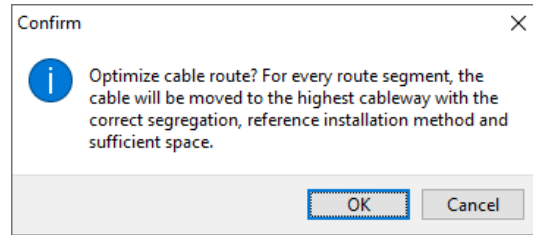
The program can find the possible routes for the cable.

You can search for the shortest path or all possible paths. And you can limit the paths to a max length. The possible paths can be seen, with a lot of details, and simply select the best one.



Optimize ... automatic function

When you have more parallel cableways – see page 29 – you can optimize the route. Maybe you don't use all parallel routes.



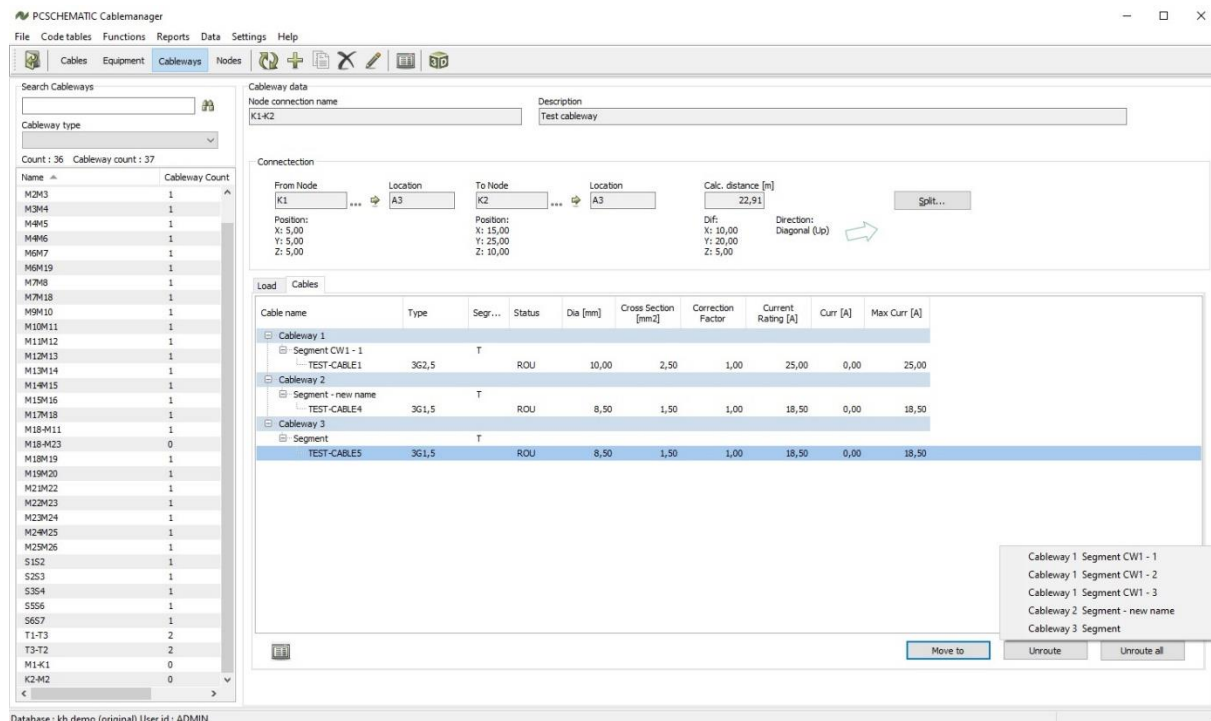
Optimize manually – move a cable on the selected cableway

You can move a Routed cable before it is released.

Go to Cableways on the Cables tab.

Select a cable, press the Move to button, and move it to one of the other segments on the node connection.

You can also unroute the cable.

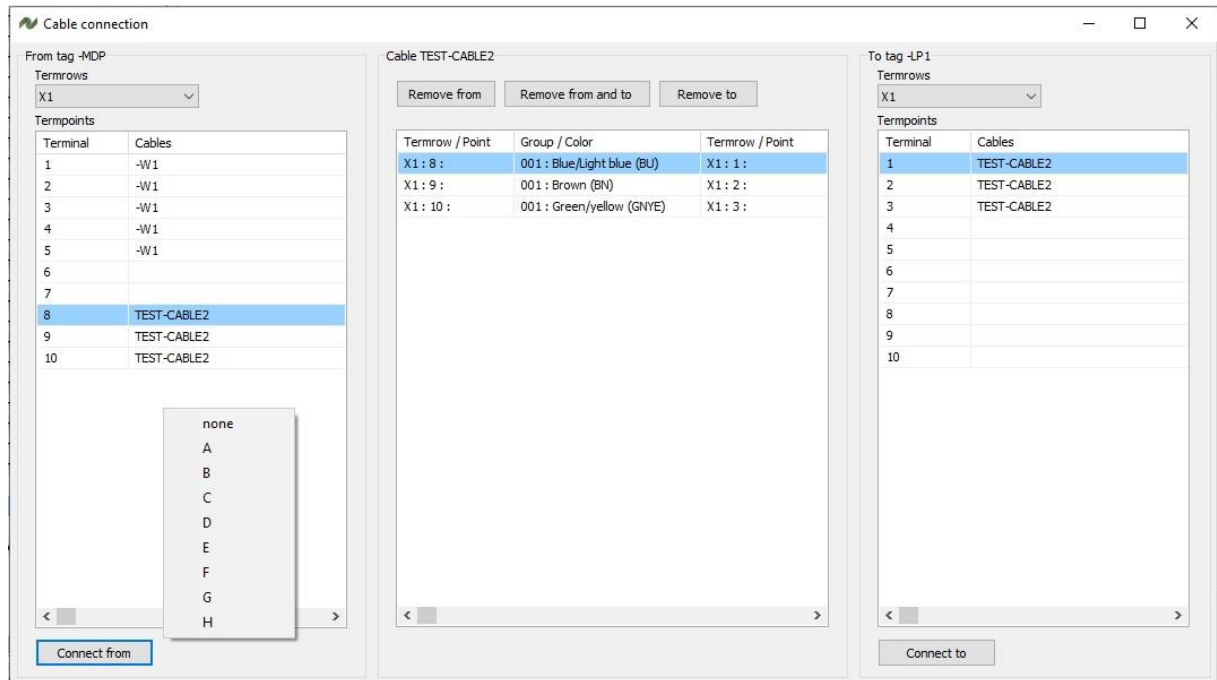


Wiring

On this tab, you can see how the cable is connected to the equipment. The information is optional.

You may need to generate wires for the cable. The wires are defined in the cable spec code table.

If both equipments have defined terminal rows, you can edit the connections by pressing the Edit connections button. See how to create the terminal row on page 23.



When you connect the cable to the terminal row, you start by selecting a Cable wire, a FROM and a TO terminal, and then click Connect from and to. ^{vii} You can – optionally – select a letter code for the terminal, ie use it for layer terminals or functionalities.

The wiring information is used on Termination reports.

Calculations

On this tab, you can make simple voltage drop calculations.

The calculations are based on

- How many phases (1, 2 or 3 phases) are used
- The voltage (230 or 400 V)
- The current consumption
- Cable length comes automatically from the cable route
- Cable values are based on the cable spec
- Default max voltage drops come from project settings

The screenshot shows the PCSCHMATIC Cablemanager software interface. The 'Calculations' tab is active, displaying various input fields and calculated results for a cable named 'TEST-CABLE2'.

Search cables: A list of cables is shown on the left, including -W1 through -W24, TEST-CABLE1, TEST-CABLE2 (selected), TEST-CABLE3, and TTT.

Cable data:

- Cable name: TEST-CABLE2
- Description: PVDK3 3G1,5
- Cable status: ROU
- Segregation: M 440V OR BELOW
- Cable type: 3G1,5
- Installation reference method: All
- Cable size / Area: 1x3x1,50 mm² / 8,5x8,5 = 72 mm²

Calculations:

- Phases: 1-Phase
- U - Voltage [V]: 230
- I - Current [A]: 2
- L - Length [m]: 23,02
- R20 - Resistance [Ω/km]: 12,1
- X20 - Reactance [Ω/km]: 0,074
- Temperature coefficient: 0,004
- Power [W]: 2576

Start / Normal:

- Start: 7
- Normal: 2
- SF - Start factor: 14
- I - Current [A]: 14
- cos(φ): 0,8
- Voltage drop: 3,259
- Voltage drop %: 2,834
- Max voltage drop: 20 %

Voltage drop:

- $R = R_{20} * (1 + \alpha * (t - 20)) = 12,1 * (1 + 0,004 * (30 - 20)) = 12,58 \Omega/km$
- $X = X_{20} * (1 + \alpha * (t - 20)) = 0,07 * (1 + 0,004 * (30 - 20)) = 0,08 \Omega/km$
- $VD = \frac{I * SF * L * (R * \cos(\phi) + X * \sin(\phi))}{1000} = \frac{2 * 7 * 23,02 * (12,58 * 0,8 + 0,08 * 0,6)}{1000} = 3,259 V$
- $VD\% = \frac{2 * VD * 100\%}{U} = \frac{2 * 3,259 * 100\%}{230} = 2,83 \%$
- Voltage at endpoint [V]: 226,741

Buttons: Save, Cancel

Database: kh demo (original) User id: ADMIN

You don't make any dimensioning on the tab, only simple voltage drop calculations.

On the main tab, you can – manually – add a current correction factor to the cable's main tab, but it is purely manual and not based on the number of parallel cables and/or reference installation methods.



Cable batch functions (super user)

There are a lot of Cable batch actions, which lets you do the same to many cables, as you can do to one cable in the previous chapter.

You start out by selecting the relevant cables, and you can select based on:

- Free search on part of name
- Cable type
- Segregation
- Cable's main status and/or Cable's least status
- Cable's length type, and you can filter on max/min lengths
- And more options, see below

Cable Name	Description	Cable Type	Cable Type Description	Cable Status	Segregation
<input checked="" type="checkbox"/> -W7	From MDP to E1 (in A1)	3G1,5	PVIKJ 3G1,5	ROU	M
<input checked="" type="checkbox"/> -W8	From LP1 to E2 (in A3)	3G1,5	PVIKJ 3G1,5	ROU	M
<input checked="" type="checkbox"/> -W9	From LP1 to E3 (in A3)	3G1,5	PVIKJ 3G1,5	ROU	M
<input checked="" type="checkbox"/> -W10	From LP1 to E4 (in A3)	3G1,5	PVIKJ 3G1,5	ROU	M
<input checked="" type="checkbox"/> -W11	From LP1 to E5 (in A3)	3G1,5	PVIKJ 3G1,5	ROU	M
<input checked="" type="checkbox"/> -W12	From LP2 to E6 (in A2)	3G1,5	PVIKJ 3G1,5	ROU	M
<input checked="" type="checkbox"/> -W13	From LP2 to E7 (in A2)	3G1,5	PVIKJ 3G1,5	ROU	M
<input checked="" type="checkbox"/> -W14	From LP2 to E8 (in A2)	3G1,5	PVIKJ 3G1,5	CR	M

The search result can then be selected/deselected, and you can then perform a batch action.

Batch route

When you batch route, the system automatically selects the shortest path. So here, the forced route – via nodes – can help you to get the best routes.

Optimize route

You can optimize the route for the selected cables, meaning that you move them upwards to the top routes, when you have parallel cableways.

Unroute/Reset status

This function lets you unroute, that is remove all selected cables from their routes, and to reset their statuses to Created. See list of cable status on page 35.

Batch print

Here you can print reports for a lot of cables in one operation:

Cable status report

One pdf-page per cable – see page 46. ^{viii}

Cable pull report

One pdf-page per cable – see page 46. You can automatically update the status for the cables at the same time.

Cable termination report

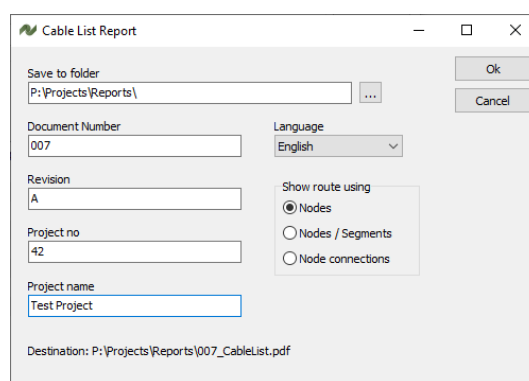
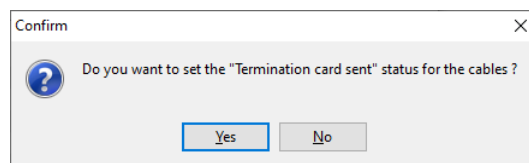
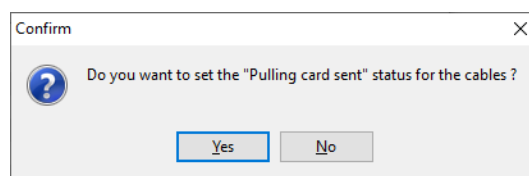
One pdf-page per cable – see page 47. You can automatically update the status for the cables at the same time.

Cable list report

You can make list reports, based on cable routes. The function generates one pdf-file with the selected information for the selected cables. See page 48.

You can show the route using

- ☒ Nodes
- ☒ Nodes / Segments
- ☒ Node connections



Generate Pulled Card sent template

The template is used, when you import ... ^{ix}

Generate wires

You can generate wires on all selected cables in one operation.

Change cable type

With this function, you can change cable type on all selected cables in one operation.

Change status

You can change the status on the selected cables.

The rule is, that you can change one status level at the time, ie go from Routed to Released. You can't go from Routed to Terminated, as that would mean that you had skipped status levels. See the list of cable statuses on page 35.

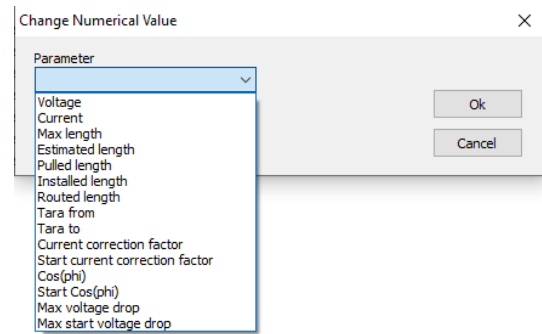
Change system

You can change the system on the selected cables.



Change numerical parameter

Here you can change a numerical value in any one of the parameters.



Change nodes

You can change nodes on selected cables, as long as they are not routed.


Change reference installation method

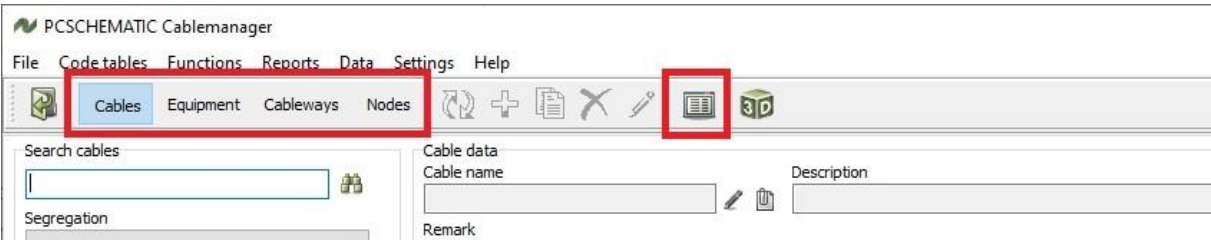
Here you change reference installation method for the selected cables. Read more about Ref. installation methods in Part 3 of the manual (Data structure ...).

Delete ...

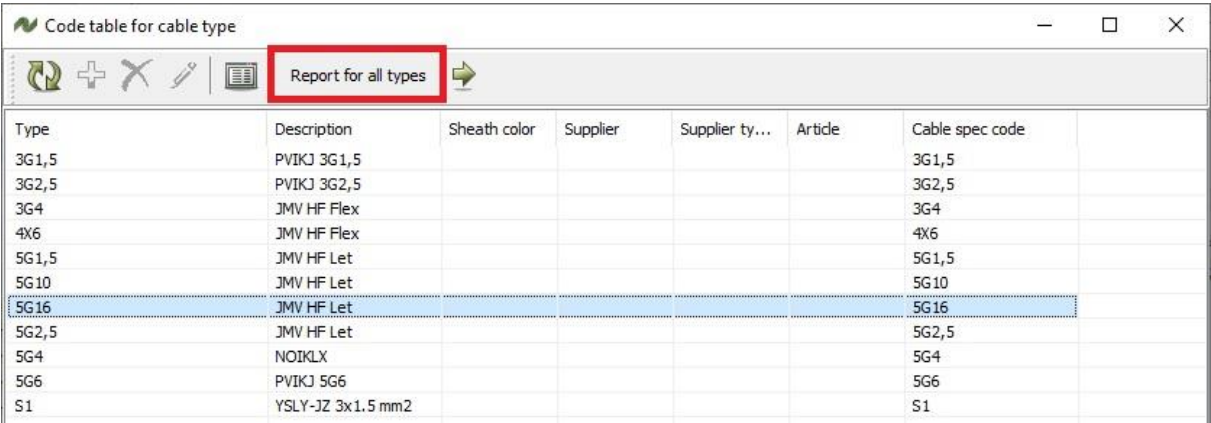
Deletes the selected cables.

REPORT OPTIONS (ALL USERS)

Reports can be printed by the program. In the toolbar, the ‘list’ button  exports the list of selected cables, equipment, segments or nodes to Excel according to which tab is open. The same button is present in many different windows, and will then export the cables, equipment, segments or nodes that are selected in the window. This section of the manual contains an example of all reports, also found in the ‘Reports’-menu. To access the reports in the menu, the relevant tab (cable, equipment, etc.) must be open.

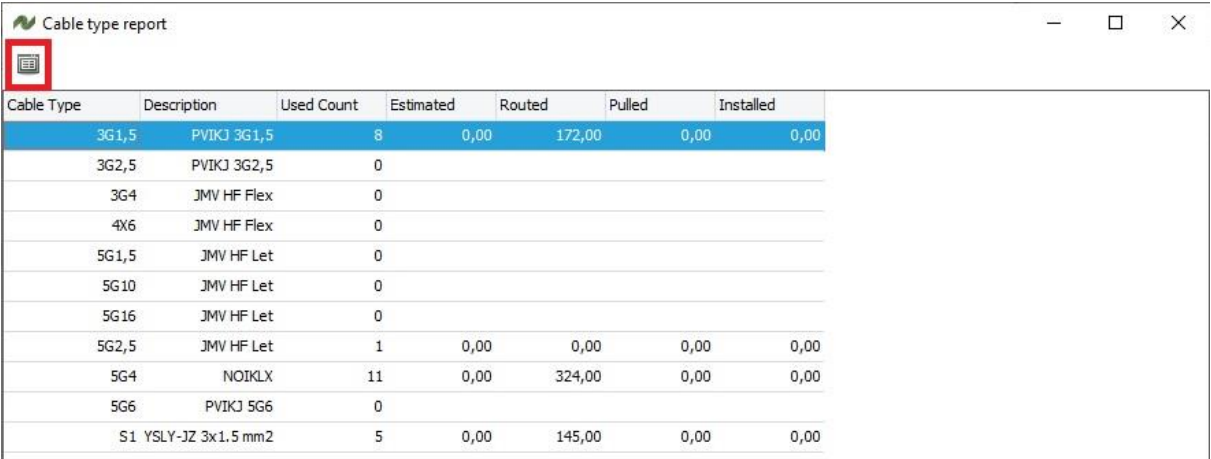


You see the same icon in many other subwindows, where it has the same functionality, i.e. export selected data to Excel. You also see the report option in many windows: It will generate a report, and in the report it is often possible to export contents to Excel.



Type	Description	Sheath color	Supplier	Supplier ty...	Artide	Cable spec code
3G1,5	PVIKJ 3G1,5					3G1,5
3G2,5	PVIKJ 3G2,5					3G2,5
3G4	JMV HF Flex					3G4
4X6	JMV HF Flex					4X6
5G1,5	JMV HF Let					5G1,5
5G10	JMV HF Let					5G10
5G16	JMV HF Let					5G16
5G2,5	JMV HF Let					5G2,5
5G4	NOIKLX					5G4
5G6	PVIKJ 5G6					5G6
S1	YSLY-JZ 3x1.5 mm2					S1

About the Code table for Cable types and below the Cable type report:

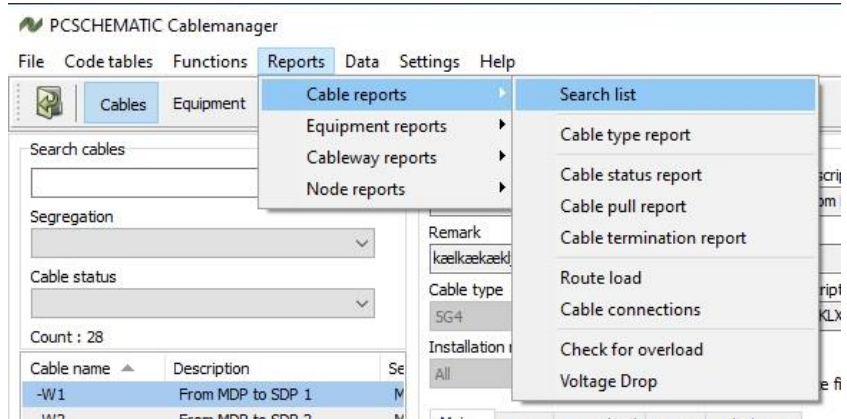


Cable Type	Description	Used Count	Estimated	Routed	Pulled	Installed
3G1,5	PVIKJ 3G1,5	8	0,00	172,00	0,00	0,00
3G2,5	PVIKJ 3G2,5	0				
3G4	JMV HF Flex	0				
4X6	JMV HF Flex	0				
5G1,5	JMV HF Let	0				
5G10	JMV HF Let	0				
5G16	JMV HF Let	0				
5G2,5	JMV HF Let	1	0,00	0,00	0,00	0,00
5G4	NOIKLX	11	0,00	324,00	0,00	0,00
5G6	PVIKJ 5G6	0				
S1	YSLY-JZ 3x1.5 mm2	5	0,00	145,00	0,00	0,00



Cable reports

Here follows a walkthrough of the different cable reports.



Search list

This exports all cables and their data to Excel. You can use it to search for specific data.

	A	B	C	D	E	F	G	H	I
1	Cable report								
2	Record count: 25								
3	Tag No	Description	From Tag No	From Tag Description	From Tag Location	From Node No	From Node Location	To Tag No	To Tag Description
4	-W1	From MDP to SDP 1	-MDP	Main distribution panel	A1	M1	A1	-SDP1	Sub-distribution pa
5	-W10	From LP1 to E4 (in A3)	-LP1	Lighting panel 1	A3	M9	A3	-E4	Light 4
6	-W11	From LP1 to E5 (in A3)	-LP1	Lighting panel 1	A3	M9	A3	-E5	Light 5
7	-W12	From LP2 to E6 (in A2)	-LP2	Lighting panel 2	A2	M21	A2	-E6	Light 6
8	-W13	From LP2 to E7 (in A2)	-LP2	Lighting panel 2	A2	M21	A2	-E7	Light 7
9	-W14	From LP2 to E8 (in A2)	-LP2	Lighting panel 2	A2	M21	A2	-E8	Light 8
10	-W15	From SDP1 to machinery M1 (in A3)	-SDP1	Sub-distribution panel 1	A3	M9	A3	-M1	Machinery 1
11	-W16	From SDP1 to machinery M2 (in A3)	-SDP1	Sub-distribution panel 1	A3	M9	A3	-M2	Machinery 2
12	-W17	From SDP1 to machinery M3 (in A3)	-SDP1	Sub-distribution panel 1	A3	M9	A3	-M3	Machinery 3
13	-W18	From SDP2 to machinery M4 (in A2)	-SDP2	Sub-distribution panel 2	A2	M21	A2	-M4	Machinery 4
14	-W19	From SDP2 to machinery M5 (in A2)	-SDP2	Sub-distribution panel 2	A2	M21	A2	-M5	Machinery 5
15	-W2	From MDP to SDP 2	-MDP	Main distribution panel	A1	M1	A1	-SDP2	Sub-distribution pa

Cable type report

A report of all cable types with the amounts of each type. This report can be exported to Excel.

Cable type report							
Cable Type	Description	Used Count	Estimated	Routed	Pulled	Installed	
3G1,5	PVIKJ 3G1,5	8	0,00	168,02	0,00	0,00	
3G2,5	PVIKJ 3G2,5	3	0,00	46,04	0,00	0,00	
3G4	JMV HF Flex	0					
4X6	JMV HF Flex	0					
5G1,5	JMV HF Let	0					
5G10	JMV HF Let	0					
5G16	JMV HF Let	0					
5G2,5	JMV HF Let	1	0,00	0,00	0,00	0,00	
5G4	NOIKLX	11	0,00	293,95	0,00	0,00	
5G6	PVIKJ 5G6	0					
S1 YSLY-JZ 3x1.5 mm2		5	0,00	145,00	0,00	0,00	

Cable status report

The cable status report tells the status of the selected cable and by whom and when it was released for various processes. The report is printed as a .pdf-file.

PCSCHEMATIC Cablemanager - Status report				
Cable tag	Description	Cable status	Segr.	
-W1	From MDP to SDP 1	ROU	M	
Cable type	Description	Cable size		
5G4	NOIKLX	1x5x4,00 mm		
Cable lengths (m)				
Estimated	Routed	Routed + Tara	Pulled	Installed
0	43	59	0	0
From		To		
Node	Tara length (m)	Node	Tara length (m)	
M1	8	M8	8	
Tag	Location	Tag	Location	
-MDP	A1	-SDP1	A3	
Description		Description		
Main distribution panel		Sub-distribution panel 1		
Gland		Gland		
Type	Size	Type	Size	
Description		Description		
Standard statuses				
Status	Date	Initials		
Created	09/07/2015	ADMIN		
Routed	20/02/2020	SUPER		
Released				
Pulling card sent				
Pulled				
Termination card sent				
Terminated from				
Terminated to				
Tested				
Installed				
Approved				
Special statuses				
Status	Date	Initials		
Suspended				
Spared				
Special				
Defective				
Pre-wired				

Cable pull report

The cable pull report contains the data that is necessary to pull the cable. This is data about the 'from' and 'to' nodes, the cable length and the route of the cable. The report is printed as a .pdf-file.

PCSCHEMATIC Cablemanager - Pull Report					
Cable tag -W1		Description From MDP to SDP 1		Cable Status PSS	Segr M
Cable Type 5G4		Description NOIKLX		Cable Size 1x5x4 mm²	
Cable Lengths (m)					
Estimated 0		Routed 59	Routed + Tara 75	Pulled 0	Installed 0
From			To		
Node M1		Tara length (m) 8		Node M8	
Tag -MDP		Location A1		Tag -SDP1	
Description Main distribution panel				Description Sub-distribution panel 1	
Gland			Gland		
Type		Size		Type	
Description				Description	
Route					
Segments 6		Length (m) 43			
M1M2 M2M3 M3M4 M4M6 M6M7					



Cable termination report

The cable termination report shows how all conductors are going to be terminated in each end.

The report is printed as a .pdf-file.

PCSCHEMATIC Cablemanager - Termination report					
Cable tag	Description			Cable status	Segr.
-W1	From MDP to SDP 1			ROU	M
Cable type	Description			Cable size	
5G4	NOIKLX			1x5x4,00 mm	
Cable lengths (m)					
Estimated	Routed	Routed + Tara		Pulled	Installed
0	43	59		0	0
From			To		
Node	Tara length (m)		Node	Tara length (m)	
M1	8		M8	8	
Tag	Location		Tag	Location	
-MDP	A1		-SDP1	A3	
Description			Description		
Main distribution panel			Sub-distribution panel 1		
Gland			Gland		
Type	Size		Type	Size	
Description			Description		
Terminal list					
Termrow	Terminal	Group	Color	Terminal	Termrow
X1	1	1	Blue/Light blue	1	X1
X1	2	1	Brown	2	X1
X1	3	1	Black	3	X1
X1	4	1	Grey	4	X1
X1	5	1	Green/yellow	5	X1

Route load

This report creates an Excel file with all route loads for the selected cable and can also be found on the 'Route load' tab.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Route load											
2	Record count: 7											
3	From Node	To Node	Segment	Cable Count	Type	Length [m]	Width [mm]	Used Width [mm]	Area [mm2]	Used Area [mm2]	Weight [kg/m]	Used Weight [kg/m]
4	M1	M2	M1M2	7	CT1	8,50	-	-	42.000	2,3%	180,000	1,2%
5	M2	M3	M2M3	6	CT1	7,50	-	-	42.000	2,2%	180,000	1,2%
6	M3	M4	M3M4	6	TRANSIT1	1,00	-	-	175.000	1,4%	1.000,000	0,2%
7	M4	M6	M4M6	5	CT1	10,00	-	-	42.000	1,8%	180,000	1,0%
8	M6	M7	M6M7	3	CT1	13,00	-	-	42.000	1,0%	180,000	0,6%
9	M7	M18	M7M18	1	TRANSIT1	1,00	-	-	175.000	0,2%	1.000,000	0,0%
10	M18	M17	M17M18	1	CT1	7,50	-	-	42.000	0,3%	180,000	0,2%

Cable connections

This report creates an Excel file with all cable connections in both ends. This list is also found on the 'Wiring' tab and in the Termination report.

	A	B	C	D	E	F
1	Cable connections					
2	Record count: 5					
3	Termrow	Termpoint	Group	Color	Termpoint2	Termrow2
4	X1	1	1	Blue/Light blue	1	X1
5	X1	2	1	Brown	2	X1
6	X1	3	1	Black	3	X1
7	X1	4	1	Grey	4	X1
8	X1	5	1	Green/yellow	5	X1
9						

Check for overload

This report lists the cables, among the selected, that are overloaded. It can be exported to Excel.

Cable check. Some cables are overloaded. 1 of 28					
Cable name	Area/Width	Weight	Voltage drop	Start voltage drop	Current
TEST-CABLE2	Ok	Ok	Ok	Overload	Ok

Voltage Drop

This report creates an Excel file with all calculation data.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Cable voltage drop report. According to DS/CLC/TR 50480											
2	Record count: 25											
3	Cable ID	Cable Type	Segregation	Length	Voltage	Phases	Full Load Current	Cos Phi	Voltage Drop (%)	Start Current	Cos Phi Start	Voltage Drop Start (%)
4	-W1	5G4	M	59,000	230,000	1	5,000	0,900	1,118	0,000	0,000	0,000
5	-W2	4X6	M	52,000	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000
6	-W3	5G4	M	59,000	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000
7	-W4	5G4	M	54,500	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000
8	-WS3	5G4	M	46,000	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000
9	-W6	5G4	M	64,500	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000
10	-W7	3G1,5	M	21,500	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000
11	-W8	3G1,5	M	40,500	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000
12	-W9	3G1,5	M	34,500	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000
13	-W10	3G1,5	M	28,000	0,000	1	0,000	0,000	0,000	0,000	0,000	0,000

Routing information (from Cable batch functions)

The list reports is based on cable routes. You can show the route using

- Nodes
- Nodes / Segments
- Node connections

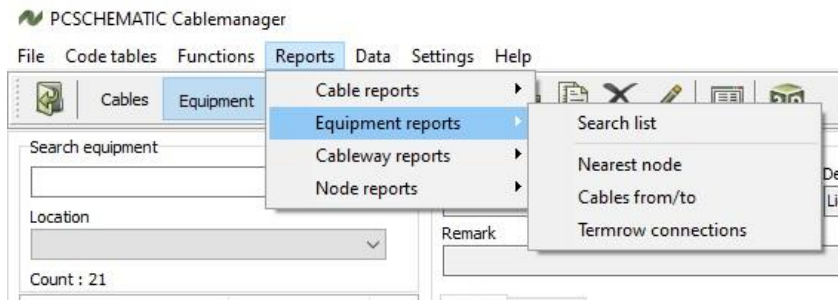
This report shows the nodes on the cable routes.

Project no: 42	Cable list	Revision: A
Project name: Test Project	Routing information	Init.: ADMIN
	System:	Date: 09/07/2020
Cable name: -W7	Cable type: 3G1,5	Routed: 6,021
Remark:		Tara length in "from" end: 8
From node: M1	From: -MDP Main distribution panel	Tara length in "to" end: 5
To node: M2	To: -E1 Light 1	Routed + Tara: 19,021
Route: M1 – M2		
Cable name: -W8	Cable type: 3G1,5	Routed: 34
Remark:		Tara length in "from" end: 8
From node: M9	From: -LP1 Lighting panel 1	Tara length in "to" end: 3
To node: M16	To: -E2 Light 2	Routed + Tara: 45
Route: M9 – M10 – M11 – M12 – M13 – M14 – M15 – M16		
Cable name: -W9	Cable type: 3G1,5	Routed: 27
Remark:		Tara length in "from" end: 8
From node: M9	From: -LP1 Lighting panel 1	Tara length in "to" end: 3
To node: M14	To: -E3 Light 3	Routed + Tara: 38
Route: M9 – M10 – M11 – M12 – M13 – M14		



Equipment reports

Here follows a walkthrough of the available equipment reports.



Search list

This creates an export to Excel of all equipment. You can use it to search for specific data. The sorting of the list is the same as in the program.

	A	B	C	D	E	F	G	H	I	J	K	L	M	
1	Equipment report													
2	Record count: 20													
3	TAG SEQ NO	TAG NO	TAG CATEGORY	DESCRIPTION	TAG TYPE	PROJECT CODE	LOCATION CODE	CONTRACTOR CODE	SYSTEM NO	DISCIPLINE CODE	REMARK	INSERTED DATE	INSERTED BY	UPDA
4		2-MDP	PL	Main distribution panel			A1							14/06/2
5		3-LP1	PL	Lighting panel 1			A3							14/06/2
6		4-LP2	PL	Lighting panel 2			A2							14/06/2
7		5-M1	PL	Machinery 1			A3							14/06/2
8		6-M2	PL	Machinery 2			A3							14/06/2
9		7-M3	PL	Machinery 3			A3							14/06/2
10		8-M4	PL	Machinery 4			A2							14/06/2
11		9-M5	PL	Machinery 5			A2							14/06/2
12		10-SDP1	PL	Sub-distribution panel 1			A3							14/06/2
13		11-SDP2	PL	Sub-distribution panel 2			A2							14/06/2
14		12-E1	PL	Light 1			A1							14/06/2
15		13-E2	PL	Light 2			A3							14/06/2
16		14-E3	PL	Light 3			A3							14/06/2
17		15-E4	PL	Light 4			A3							14/06/2
18		16-E5	PL	Light 5			A3							14/06/2
19		17-E6	PL	Light 6			A2							14/06/2
20		18-E7	PL	Light 7			A2							14/06/2
21		19-E8	PL	Light 8			A2							14/06/2
22		20-MCP1	PL	Motor control panel 1			A3							10/05/2

Nearest node

This report creates a list of the nearest nodes to the selected Equipment and can be exported to Excel. This list is also found on the 'Main' tab.^x

Node name		Tara length
M1		0
M10		0
M11		0

Count = 3

Cables from/to

This report creates a list of the cables that go from the selected equipment. It contains information about the cable status, lengths and the connected equipment. It can be exported to Excel and the list is also found on the 'Main' tab.^{xi}

Cables from/to -MDP								
Cable name	Description	Cable type	Cable status	Segregation code	From tag	From tag desc	From tag location	From node
-W1	From MDP to SDP 1	5G4	ROU	M	-MDP	Main distribution	A1	
-W2	From MDP to SDP 2	4X6	ROU	M	-MDP	Main distribution	A1	
-W3	From MDP to LP1	5G4	ROU	M	-MDP	Main distribution	A1	
-W4	From MDP to LP2	5G4	ROU	M	-MDP	Main distribution	A1	
-WS3	From MDP to MCP1	5G4	ROU	M	-MDP	Main distribution	A1	
-W6	From MDP to MCP2	5G4	ROU	M	-MDP	Main distribution	A1	
-W7	From MDP to E1 (in	3G1,5	ROU	M	-MDP	Main distribution	A1	

Termrow connections

This report creates a list of the terminal connections on the equipment and can also be found on the 'Main' tab. Select an equipment in the list, and the report will show the connections to its terminal row(s).

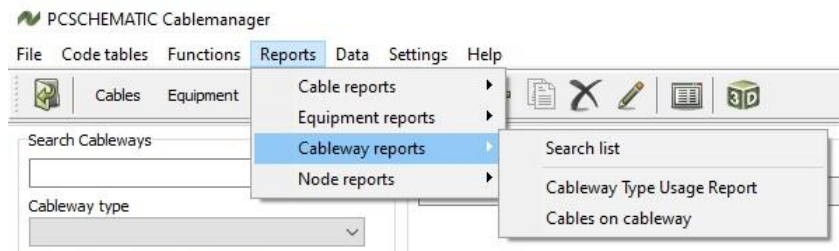
1	Termrow connections			
2	Record count: 11			
3	Row : terminal : connection	Cable : group : wire		
4	X1 : 1 :	-W1 : 001 : 1		
5	X1 : 10 :	TEST-CABLE2 : 001 : 3		
6	X1 : 2 :	-W1 : 001 : 2		
7	X1 : 3 :	-W1 : 001 : 3		
8	X1 : 4 :	-W1 : 001 : 4		
9	X1 : 5 :	-W1 : 001 : 5		
10	X1 : 8 :	TEST-CABLE2 : 001 : 1		
11	X1 : 9 :	TEST-CABLE2 : 001 : 2		
12	X2 : 1 :	TEST-CABLE1 : 001 : 1		
13	X2 : 2 :	TEST-CABLE1 : 001 : 2		
14	X2 : 3 :	TEST-CABLE1 : 001 : 3		



Cableway reports

Here follows a walkthrough of the segment reports.

xii



Search list

This creates an export to Excel of all Segments on Cableways. You can use it to search for specific data. The sorting of the list is the same as in the program.

1	Export of Cableways											
2	Record count: 42											
3	Node connection name	From Node	To Node	Segment name	Cableway Type	Segregation	Cable count	Used area/width	Reference installation method	Fill factor	Avail area/width	Max area
4	K1-K2	K1	K2	Segment	CT1	T	0	0,000 Area		1,000	60000,000	6
5	K1-K2	K1	K2	Segment - new name	CT1	T	0	0,000 Area		1,000	60000,000	6
6	K1-K2	K1	K2	Segment CW1 - 1	CT1	T	0	0,000 Area		1,000	30000,000	3
7	K1-K2	K1	K2	Segment CW1 - 2	CT1	M	0	0,000 Area		1,000	15000,000	1
8	K1-K2	K1	K2	Segment CW1 - 3	CT1	S	0	0,000 Area		1,000	15000,000	1
9	M10M11	M10	M11	Segment	CT1	M	6	648,750 Area		0,700	42000,000	6
10	M11M12	M11	M12	Segment	CT1	M	5	504,750 Area		0,700	42000,000	6
11	M12M13	M12	M13	Segment	CT1	M	4	432,500 Area		0,700	42000,000	6
12	M13M14	M13	M14	Segment	CT1	M	3	288,500 Area		0,700	42000,000	6
13	M14M15	M14	M15	Segment	CT1	M	2	216,250 Area		0,700	42000,000	6
14	M15M16	M15	M16	Segment	CT1	M	1	72,250 Area		0,700	42000,000	6
15	M17M18	M18	M17	Segment	CT1	M	1	144,000 Area		0,700	42000,000	6
16	M18-M11	M18	M11	Segment	CT1	M	0	0,000 Area		1,000	30000,000	3
17	M18-M11	M18	M11	Segment	CT1	M	0	0,000 Area		1,000	30000,000	3

Cableway Type Usage report

Here you get a list of the cableway types that are in use in the project. The list can be exported to Excel.

Cableway type usage			
Cableway type	Description	Length	Count
CT1	Cable tray	241,21	34
TRANSIT1	Transit	3,00	3

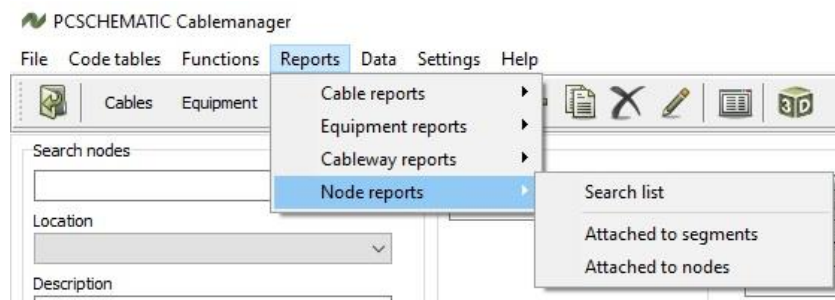
Cables on Node connection (Cableway/segment)

This is a list of the cables on a selected Node connection/Cableway. It can be exported to Excel.

Cables on Node connection								
Cableway	Segment	Cable name	Type	Status	Diameter [mm]	Cross section	Current correction	Current rating [A]
Cableway 1	Segment	-W1	5G4	PSS	12,00	4,00	1,00	42
Cableway 1	Segment	-W7	3G1,5	ROU	8,50	1,50	1,00	18
Cableway 1	Segment	-W5	5G4	PULL	12,00	4,00	1,00	42
Cableway 1	Segment	-W6	5G4	ROU	12,00	4,00	1,00	42
Cableway 1	Segment	TEST-CABLE2	3G2,5	ROU	10,00	2,50	1,00	25
Cableway 1	Segment	TEST-CABLE3	3G2,5	ROU	10,00	2,50	1,00	25

Nodes reports

Here follows a walkthrough of the node reports.



Search list

This exports a list of all nodes to Excel and is used to search for specific data. The sorting of the list is the same as in the program.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Node report											
2	Record count: 33											
3	Node SEQ NO	Node NO	DESCRIPTION	LOCATION CODE	SEGREGATION CODE	x	y	z	INSERTED DATE	INSERTED BY	UPDATED DATE	UPDATED BY
4	11 M1			A1	M	5,000	19,500	5,000			10/05/2017 12:20:05	ADMIN
5	1 M10			A3	M	27,000	7,000	5,000			10/05/2017 12:25:51	ADMIN
6	2 M11			A3	M	20,500	7,000	5,000			10/05/2017 12:25:32	ADMIN
7	3 M12			A3	M	15,000	7,000	5,000			10/05/2017 13:58:36	ADMIN
8	4 M13			A3	M	11,500	7,000	5,000			10/05/2017 12:24:13	ADMIN
9	5 M14			A3	M	8,500	7,000	5,000			10/05/2017 12:23:46	ADMIN
10	6 M15			A3	M	5,000	7,000	5,000			10/05/2017 12:21:27	ADMIN
11	7 M16			A3	M	2,500	7,000	5,000			10/05/2017 12:23:20	ADMIN
12	8 M17			A2	M	30,500	17,500	5,000			10/05/2017 12:30:05	ADMIN
13	9 M18			A2	M	28,000	12,000	5,000			10/05/2017 12:30:33	ADMIN
14	10 M19			A2	M	15,000	12,000	5,000			10/05/2017 12:31:02	ADMIN
15	20 M2			A1	M	1,000	15,000	5,000			10/05/2017 12:22:12	ADMIN
16	13 M20			A2	M	12,000	19,500	5,000			10/05/2017 12:29:16	ADMIN
17	14 M21			A2	M	14,000	19,500	5,000			10/05/2017 12:28:53	ADMIN

Attached to segment

This report creates an Excel file that shows which segments the node is attached to and can also be found in the 'Attached to segments' tab.

	A	B	C	D	E
1	Attached to segments				
2	Record count: 2				
3	Segment name	Spec	Subtype	From node	To node
4	M10M11	CT1	TRAY	M10	M11
5	M9M10	CT1	TRAY	M9	M10

Attached to nodes

This creates an Excel file that shows which nodes are attached through the neighbouring segments and can also be found in the 'Attached to segments' tab.

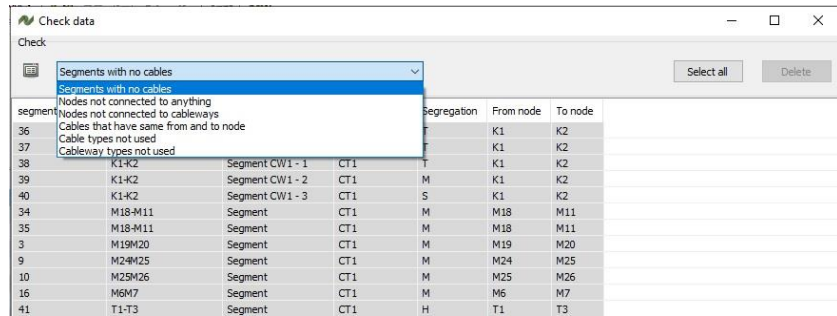
	A	B	C
1	Attached to nodes		
2	Record count: 2		
3	Node	Segment name	To node
4	M10	M10M11	M11
5		M9M10	M9



Check data function

It can be necessary from time to time to check data in the database. In

Data|Check data, you have the following options:



- Segments with no cables
- Nodes not connected to anything
- Nodes not connected to cableways
- Cables that have the same from and to node
- Cable types not used
- Cableway types not used

For all checks, you can make export to Excel of the result. For some options – e.g. not used cable types – you can delete one or more objects.

Check Cable routes

In the Data menu, you can also Check cable routes.

This function xxxxxx???

3D VIEW

The 3D view function, is the most advanced report type in the program. It lets you see and simulate the segment loads in the full project or part of the project in an easy way. When you open the function, you can select the Locations and Segregations, that you want to see:

[illegible]



You can make a list of cables, and select a specific one which you want to jump to.
You can export to the 3D view – see more below – or to a dxf-file. In the dxf-file, you get the same information.



3D viewer

Based on the coordinates from Nodes and Cableways, you see a generated 3D view of the project.

In the top tool bar, you can use the icons to navigate:

- The  lets you move the view – drag the mouse to move
- The  lets you pan and tilt the view – drag the drawing to tilt

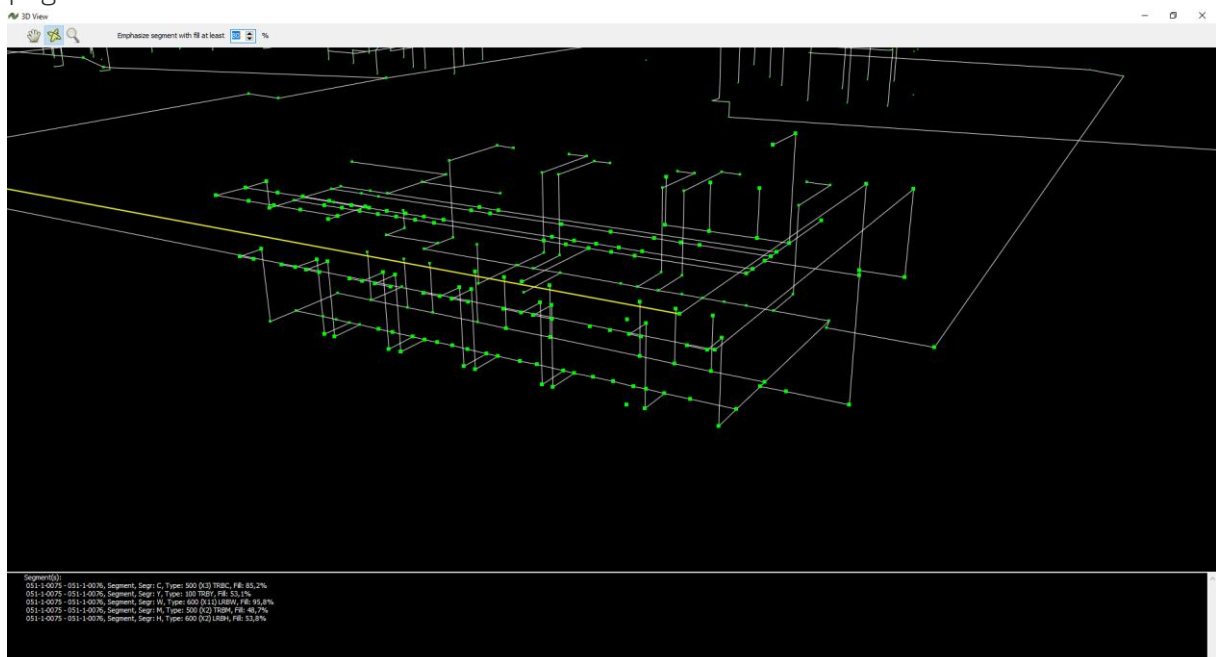
Select the control icon and the mouse to navigate on the page. You can also use the mouse

Emphasize segment with fill at least %

This function lets you highlight the segments that are overloaded, here with more than 80%, but you simply type another figure, if you want that.

You can also select individual segments, and at the bottom of the drawing, you can see the segment's name, type, segregation and fill.

Or you can zoom in, and select a specific node, and see the node name at the bottom of the page.



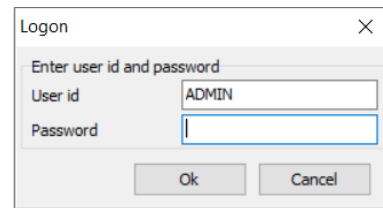
USER ADMINISTRATION (ADMIN)

After installing the program only one user is registered – ADMIN. With the password ADMIN.

All users and passwords belong to a project as they are stored in the project database.

That means that the users are defined in the project in Cablemanager, also the users that only work in the Cablemanager Service program.

It also means, that the relevant users must created with every new project.



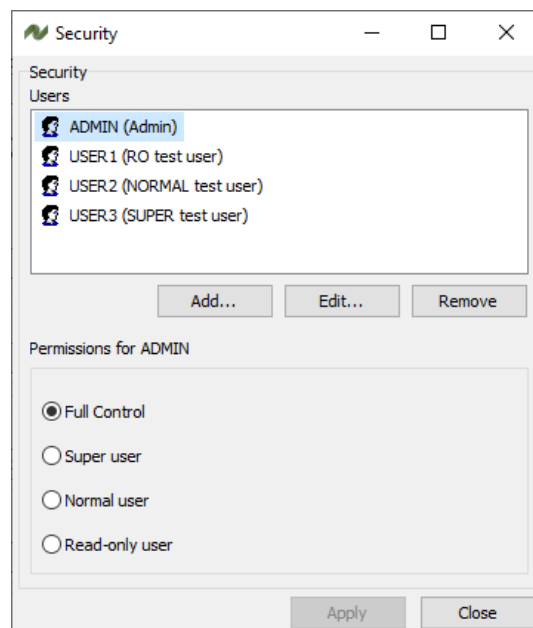
A small dialog box titled 'Logon' with a close button (X) in the top right corner. It contains a label 'Enter user id and password' above two text input fields. The first field is labeled 'User id' and contains the text 'ADMIN'. The second field is labeled 'Password' and is empty. At the bottom are two buttons: 'Ok' and 'Cancel'.

Create, change, or delete a user

This is done by going to the settings menu and choosing 'Users...'.
The function is only available for ADMIN.

A user name must be at least five characters long.

xiii



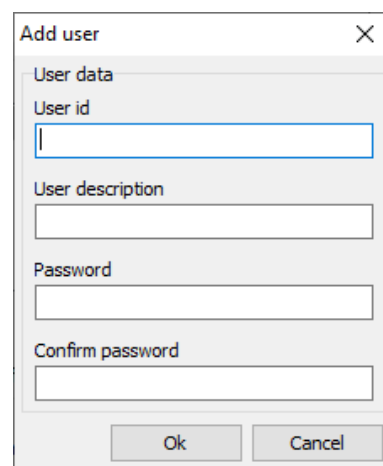
A dialog box titled 'Security' with a close button (X) in the top right corner. It has a tab labeled 'Users'. Below the tab is a list of users: 'ADMIN (Admin)', 'USER1 (RO test user)', 'USER2 (NORMAL test user)', and 'USER3 (SUPER test user)'. Each user has a small icon to its left. Below the list are three buttons: 'Add...', 'Edit...', and 'Remove'. Below these buttons is a section titled 'Permissions for ADMIN' containing four radio button options: 'Full Control' (selected), 'Super user', 'Normal user', and 'Read-only user'. At the bottom are two buttons: 'Apply' and 'Close'.

Create a user

Click the Add button to create a new user.

Type the necessary data and click 'Ok'.

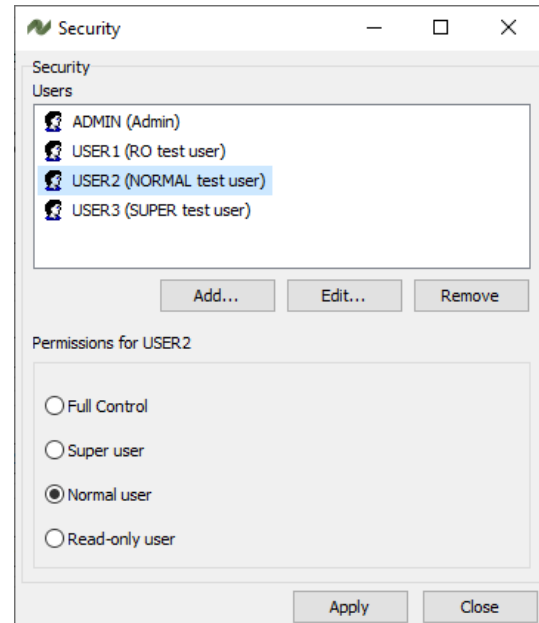
New users are always created as Read-only users.



A dialog box titled 'Add user' with a close button (X) in the top right corner. It contains a section labeled 'User data' with four text input fields: 'User id', 'User description', 'Password', and 'Confirm password'. At the bottom are two buttons: 'Ok' and 'Cancel'.

Change user rights

Change user rights by selecting the user and select the user rights that should apply to the user and then click the Apply button.



User rights

User type	Description
Read-only user	User with lowest rights. The user can <ul style="list-style-type: none"> ■ View data, but cannot change anything ■ Print various lists by using the icon present in most windows
Normal user	The user has the same rights as described above, and can also <ul style="list-style-type: none"> ■ Route individual cables ■ Change status on routed cables ■ Add comments ■ Print reports that change cable status (pulling and termination card)
Super user	The user has the same rights as described above, and an also <ul style="list-style-type: none"> ■ Create and change equipment, cables and segments ■ Batch operation: All batch operations (route, change cable type, print, generate wires, unroute, remove status)
Full control (Admin)	The user has the same rights as described above, and an also <ul style="list-style-type: none"> ■ Import data ■ Edit segment names and data ■ Create, edit, and delete other users
Automation Service user ^{xiv}	Users for the Automation Service program are created in Cablemanager. They have the same options as Read-only users, but – importantly – they can change cable status. The program is a workshop license to the data. <ul style="list-style-type: none"> ■ View data, but cannot change anything ■ Print various lists by using the icon present in most windows ■ Change cable status and lengths on released cables ■ Batch operation on released cables: Print cable status, pulling and termination card

SETTINGS

The settings in the program can be set to fit the project's requirements. This chapter gives an overview of the options.

Project settings

- Voltage drop calculation: The temperature can be changed for the project
- Default voltage drops can be set. Larger voltage drops will result in red fields in the voltage drop tab. And the cables can be found in reports.
- Cableway lengths can be calculated automatically, based on the nodes' coordinates
- Default distance?^{xv}
- Cablemanager Service users can be allowed to change cable lengths and status. This setting is needed, if you want the Service program to be a workshop program.
- Current correction factor ^{xvi}. This is a factor, that applies to parallel cables according to the rules found in IEC 60364. The Cablemanager cannot make cable dimensioning, so this is a manual factor, that can be typed into the system. When the factor is 1, the cable's current rating follows the cable specification. When you have parallel cables, you are not allowed to load the cable fully, so you set a Correction factor, which multiplies with the current rating and show you the allowed max current for the cable. In case you overload your cable, the Current field on the cable's main tab turns red.
- Connection naming: Node connections (first level of cableways) can be named automatically according to these settings.

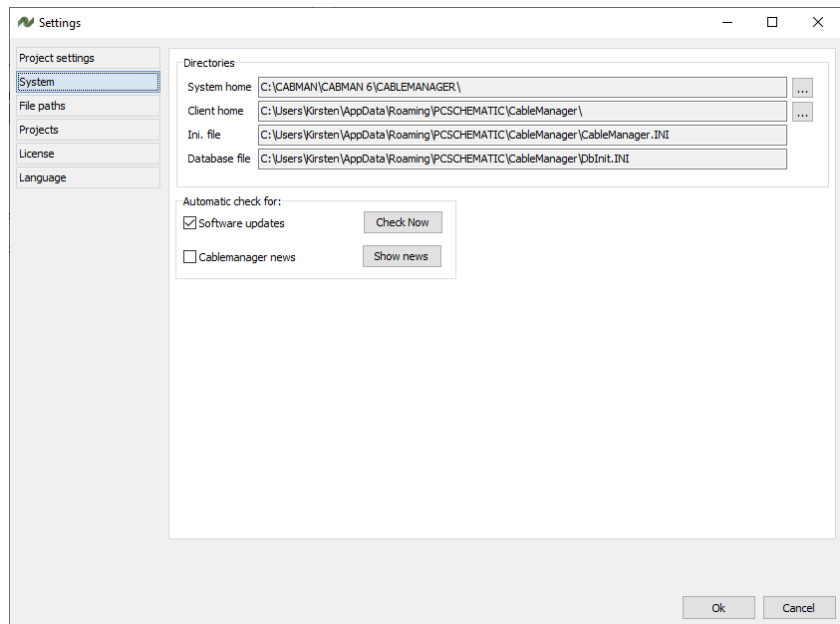
The screenshot shows the 'Settings' dialog box with the 'Project settings' tab selected. The left sidebar lists 'Project settings', 'System', 'File paths', 'Projects', 'License', and 'Language'. The main area contains several configuration sections:

- Voltage drop calculation:** Temperature is set to 30 °C.
- Default max. voltage drop:** Normal is 4 %, Start is 20 %.
- Cableway:** ☒ Calculate length automatically. Default cableway vertical distance is 0,00 m.
- Cablemanager Service options:** ☐ Allow cable lengths/status changes.
- Correction current factor:** Standard current correction factor is 1. ☐ Apply this to all existing cables.
- Connection naming:** ☒ Automatic connection naming using nodes. Separator is '-' (with a 'Spaced' option). Example: N1-N2.

At the bottom right are 'Ok' and 'Cancel' buttons.

System settings

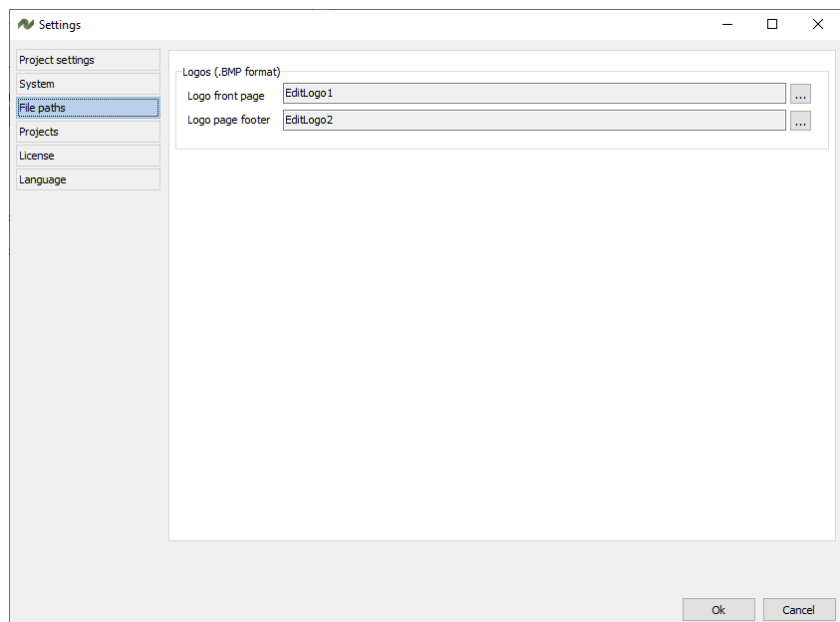
- Directories: here you can see the directories for the system's files. The directories are selected during installation
- Check for program updates and news



Report logos

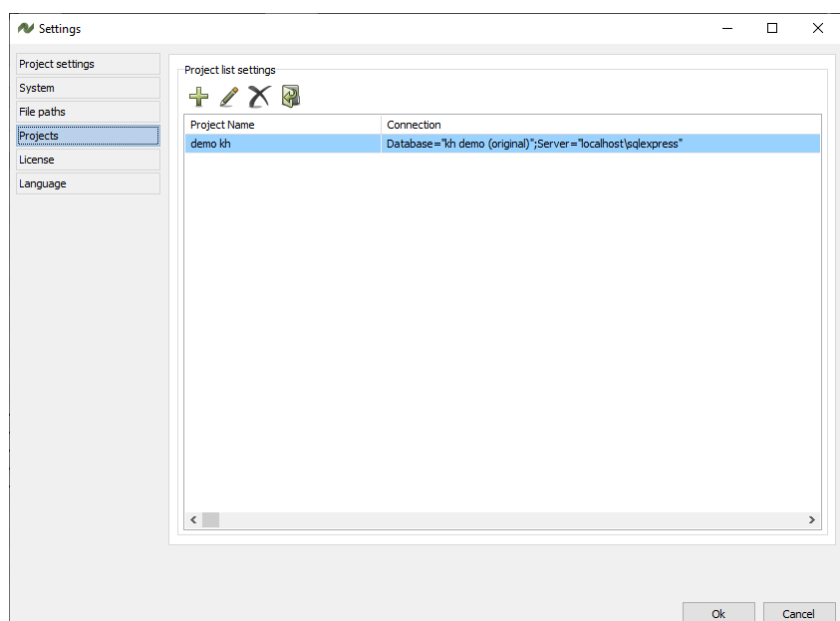
- File paths to logos that are on reports. The logo must be a *.bmp type.
- In this way you can personalize your pull, termination and status reports.

xvii



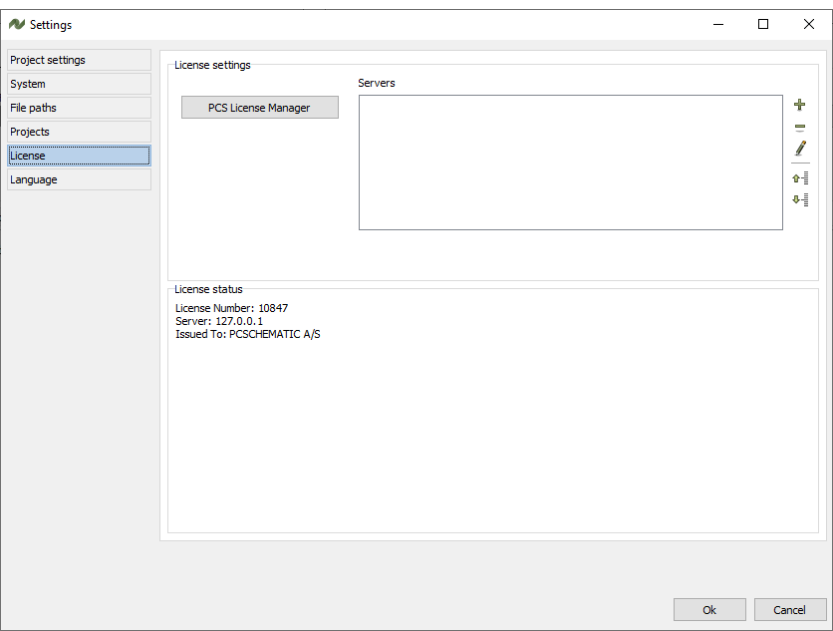
Projects

Here you see a list of the projects that you have access to. The list can be edited by using the icons in the top toolbar.



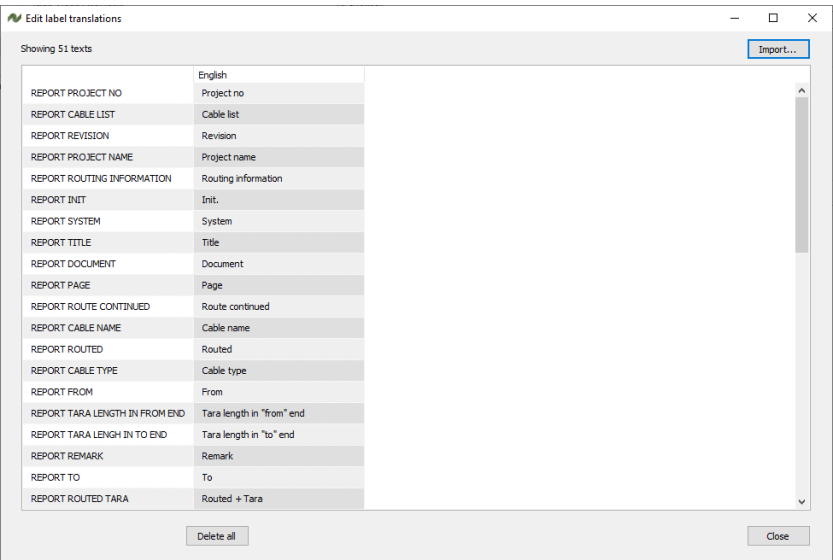
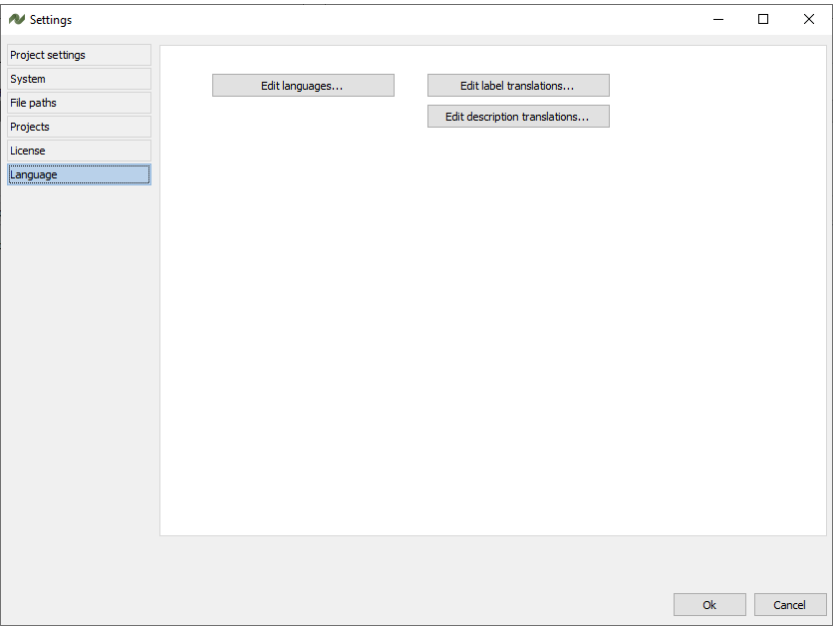
License

Here you can see which license, you are using. You can also access the License Manager, change the license selections, etc..



Language

You can change the user language in the program. You can add (and delete) languages to the system. You can edit all labels in the program, and in that way make your own language settings.



My notes

[illegible]

[illegible]

My notes

[illegible]