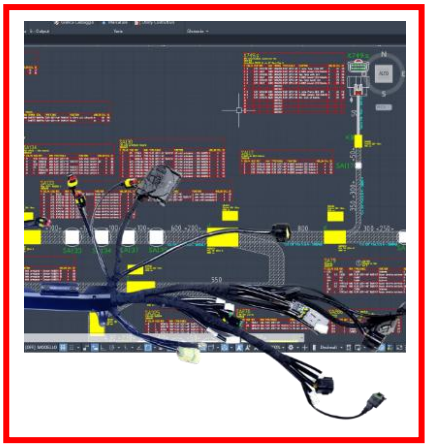
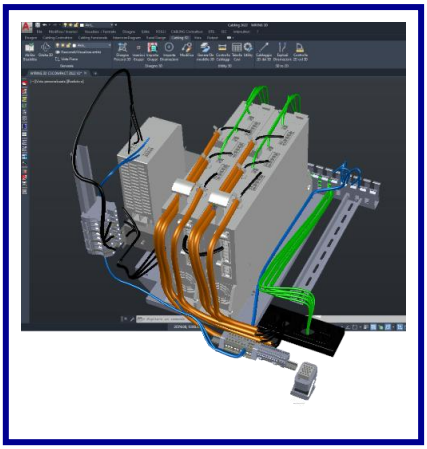
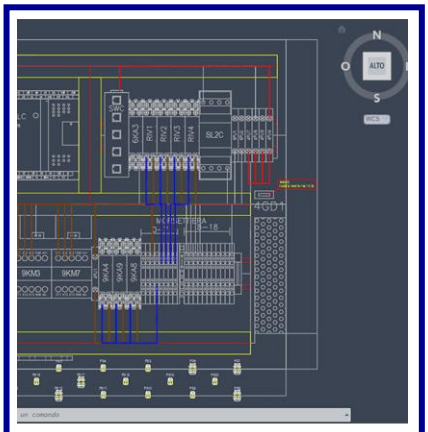
NEW RELEASE 2025



CABLING 4D



CAD.Able



CABLING

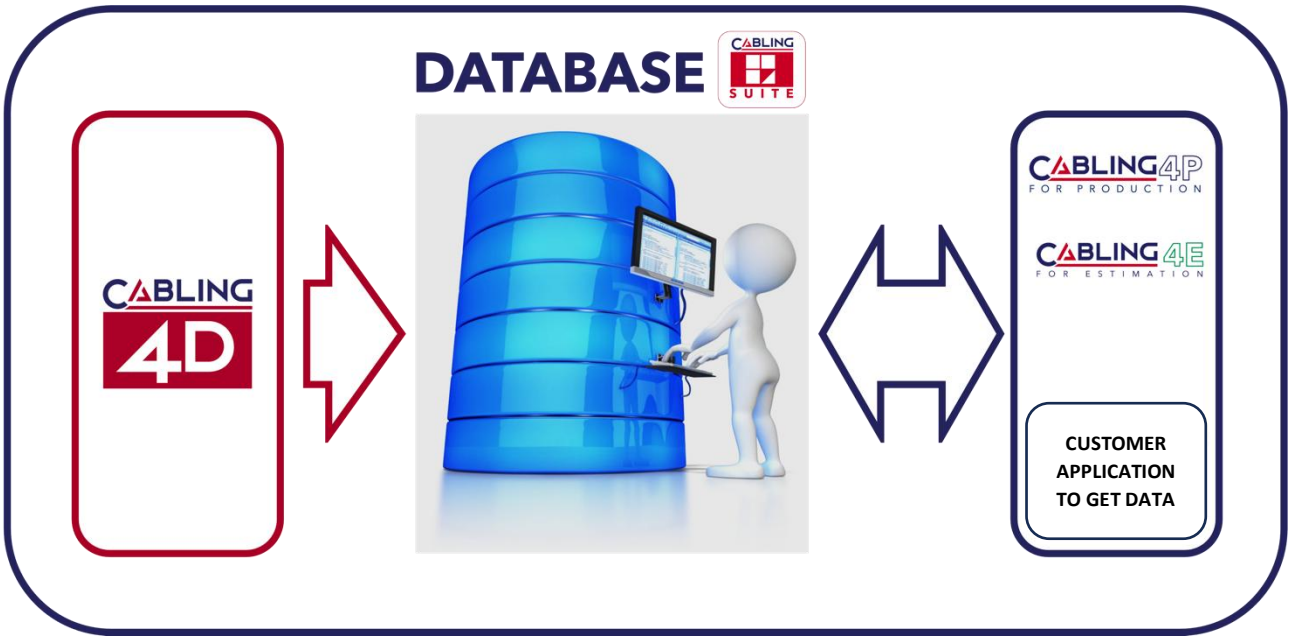
CAD.Able s.r.l.
C.so Giambone, 69
10134 - Torino - Italy
Tel. +39 011 614236
info@cadable.it
www.cadable.it

THE NEW RELEASE 2025

SIMPLIFY YOUR DAILY WORK AND SUPPORT YOUR BUSINESS GROWTH

THE NEW **2025 RELEASE** MARKS AN IMPORTANT MILESTONE IN PRODUCT DEVELOPMENT, ACHIEVED WITH THESE INNOVATIONS:

1. **EVOLUTION OF THE USER INTERFACE** TO FACILITATE ITS USE BY USERS AND INCREASE THE SPEED OF DESIGN
2. **STABILITY OF OPERATION** TO ENSURE MAXIMUM PERFORMANCE
3. **SIMPLIFICATION OF USE** WHILE INCREASING POTENTIAL
4. INCREASE IN THE **POTENTIAL** OF DESIGNING THE **ELECTRICAL DIAGRAM**
5. **IMPROVEMENT** OF DESIGN WITH **PANEL DESIGN**, A MODULE FOR DESIGNING SMALL/MEDIUM-SIZED ELECTRICAL PANELS
6. CREATION OF A **CENTRALIZED DATABASE** WHERE TO SAVE THE HARNESS DATA DESIGNED WITH CABLING 4D.
   IN THE NEW **CABLING SUITE** (EXTERNAL PROGRAM IN WINDOWS ENVIRONMENT) TWO APPLICATIONS ARE AVAILABLE: CABLING 4P (FOR PRODUCTION) AND CABLING 4E (FOR ESTIMATION) RESPECTIVELY TO MANAGE HARNESSES DATA TOWARDS AUTOMATIC CUTTING/STRIPPING/CRIMPING MACHINES AND TO CALCULATE PRODUCTION TIMES.



CABLING 4P (FOR PRODUCTION)

IT IS THE BASIS FOR SOLVING ORGANIZATIONAL PROBLEMS RELATED TO THE PRODUCTION PROCESS, HAVING AN OVERALL VISION, IN ORDER TO IMPROVE PLANNING AND KNOW HOW TO MANAGE EMERGENCIES WITHOUT INTERRUPT BUSINESS CONTINUITY.

DISCOVER ALL THE ADVANTAGES OF CABLING 4P

CABLING 4E (FOR ESTIMATION)

IT REPRESENTS AN INDISPENSABLE SOLUTION FOR COMPANIES WISHING TO IMPROVE OPERATIONAL EFFICIENCY AND OBTAIN A CLEAR VISION OF THE COSTS ASSOCIATED WITH HARNESSES PRODUCTION.

DISCOVER ALL THE ADVANTAGES OF CABLING 4E

EVER GREATER INTEGRATION
CABLING 4D AND SPAC AUTOMAZIONE

WITH THE GOAL ACHIEVED OF INTEGRATING CABLING 4D WITH THE GREATER NUMBER OF INDUSTRIAL ENVIRONMENTS, INTERACTION WITH **SPAC AUTOMAZIONE 2025** HAS BEEN STRENGTHENED IF THE **CABLES MODULE 9** IS PRESENT.

THE CAVI MODULE 9 ALLOWS THE MANAGEMENT OF MULTIPOLE AND CONNECTORIZED CABLES ON SPAC AUTOMAZIONE DIAGRAMS.

THE INTERACTION OF SPAC AUTOMAZIONE WITH CABLING TAKES PLACE IN A BIDIRECTIONAL WAY THROUGH:

- **IMPORTING** SPECIAL CABLES (OR HARNESSES) DESIGNED WITH CABLING 4D **INTO SPAC AUTOMAZIONE 2025**: THE SAVED ASSEMBLIES ARE CONSIDERED WITH THE POSSIBILITY OF ATTRIBUTING THE CONNECTIONS OF THE ELECTRICAL DIAGRAM THE BELONGING TO SUCH ASSEMBLIES, THE POSSIBILITY OF INSERTING THEIR LAYOUT AND OF INTEGRATING THE ASSEMBLED CODE AND THE MATERIALS THAT COMPOSE IT IN THE SPAC MATERIAL DRAWING.
- **IMPORTING** AN ELECTRICAL DIAGRAM DESIGNED WITH SPAC **INTO CABLING 4D 2025:** A SPECIAL ELECTRICAL DIAGRAM NAVIGATION WINDOW ALLOWS YOU TO CHOOSE WHICH ELEMENTS TO USE FOR DESIGNING A CABLE LAYOUT (OR HARNESS). IN THIS VERSION IT IS POSSIBLE TO IMPORT ONLY THE CONNECTIONS THAT HAVE BEEN ATTRIBUTED TO AN ASSEMBLY IN SPAC AUTOMAZIONE, SO AS TO MAKE IMPORTING EVEN EASIER.

INSTALLABLE ON

AutoCAD OEM version

Autodesk 2025 64 bit graphic engine

APP to AutoCAD version

Installable on AutoCAD 2023, 2024 and 2025

HARDWARE & SOFTWARE REQUIREMENT

Minimum hardware & software configuration required:

HARDWARE

Personal Computer

- Processore Intel Core i5© or higher with SSE2 technology
- Processore AMD Ryzen 5TM or higher with SSE2 technology
- Mouse or other pointing device
- Possible plotter or printer
- 8 GB RAM memory

Video card

- 1 GB video card with 29 GB/s of bandwidth, compatible DirectX 11
- Screen DPI scale factor less than or equal to 125%
- Are compatible also the Ultra HD-4K monitors

USB Ports

- USB port for the hardware protection
- USB 2.0 port for installation

Free space on disk:

- CABLING 4D 2025 7.5 GB
- CABLING 4D CAD 2025 9.5 GB (associated to SPAC Automation CAD 2025)

Internet access for the installation and on-line update

SOFTWARE

O.S.

- Windows© 10 64 bit - version 1909 or successive
- Windows© 11 64 bit

App to AutoCAD

- Autodesk AutoCAD or Electrical rel. 2023/2024/2025 already installed and working.
- AutoCAD LT is not valid for the installation.

OEM version

- Autodesk AutoCAD© is not required with SPAC Automation OEM engine.

Suggested hardware configuration:

- 3GHz Intel® Core™ i7 or AMD Ryzen™ 7 Processor with SSE2 technology
- 4 GB video card with 106 GB/s of bandwidth, compatible DirectX 11
- USB 3.0 port for installation
- RAM memory: 16 GB
- Autodesk certified graphics hardware and drivers available at the following link https://knowledge.autodesk.com/it/certified-graphics-hardware

Attention

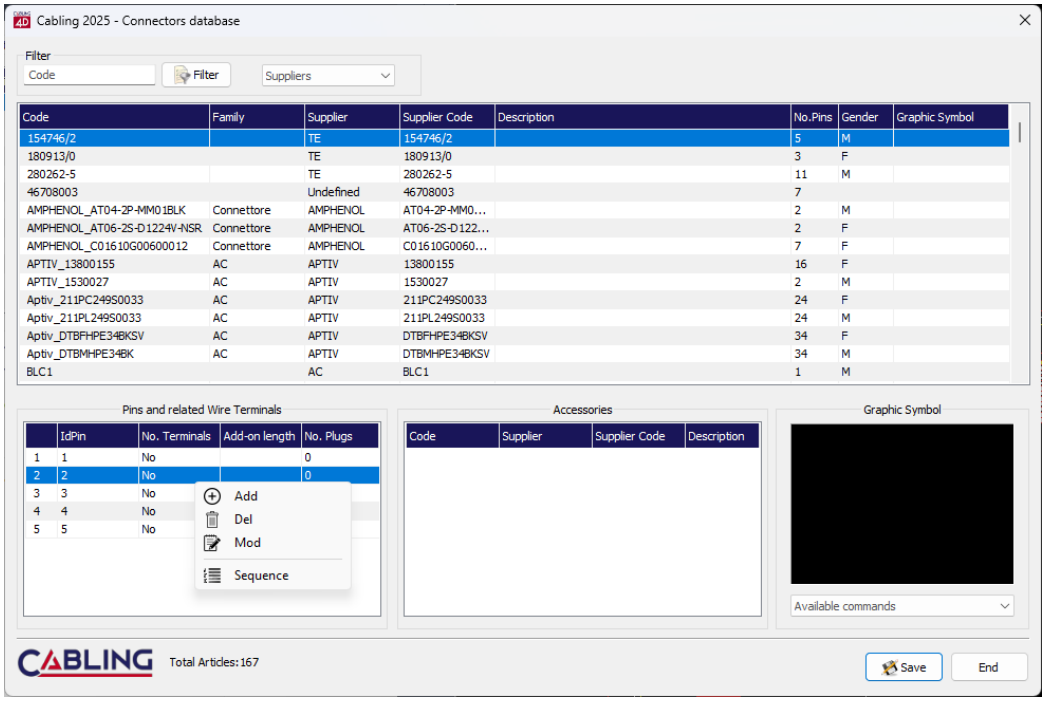
- System administrator permissions are required to install.

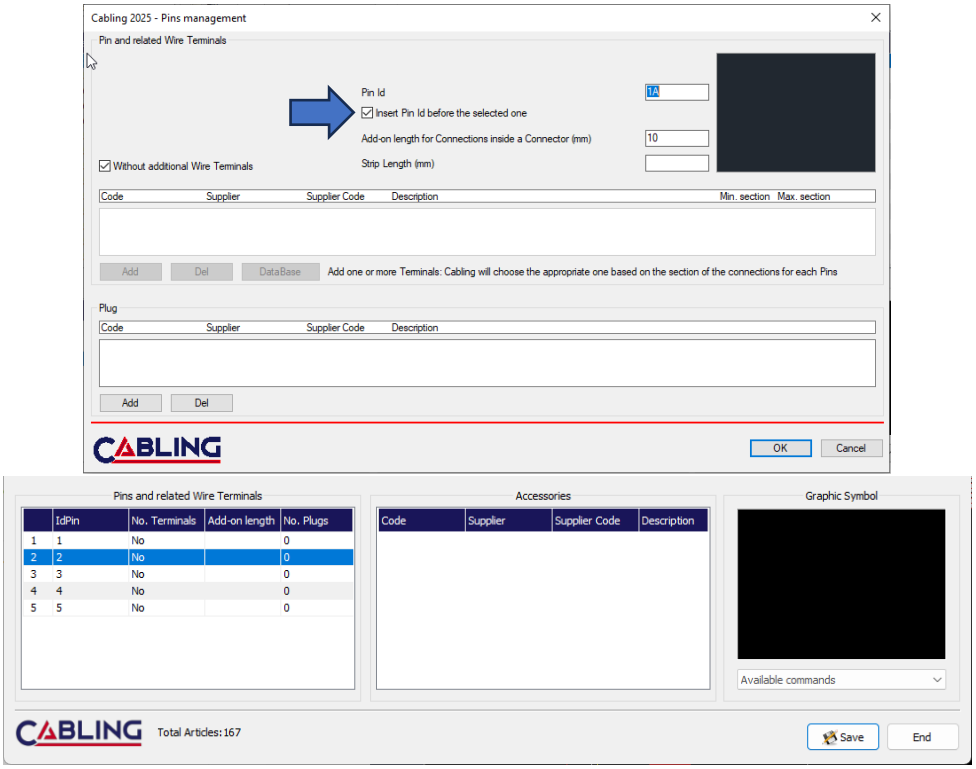
INDEX

1 MISCELLANEOUS

1.1 CONNECTORS MATERIAL DATABASE

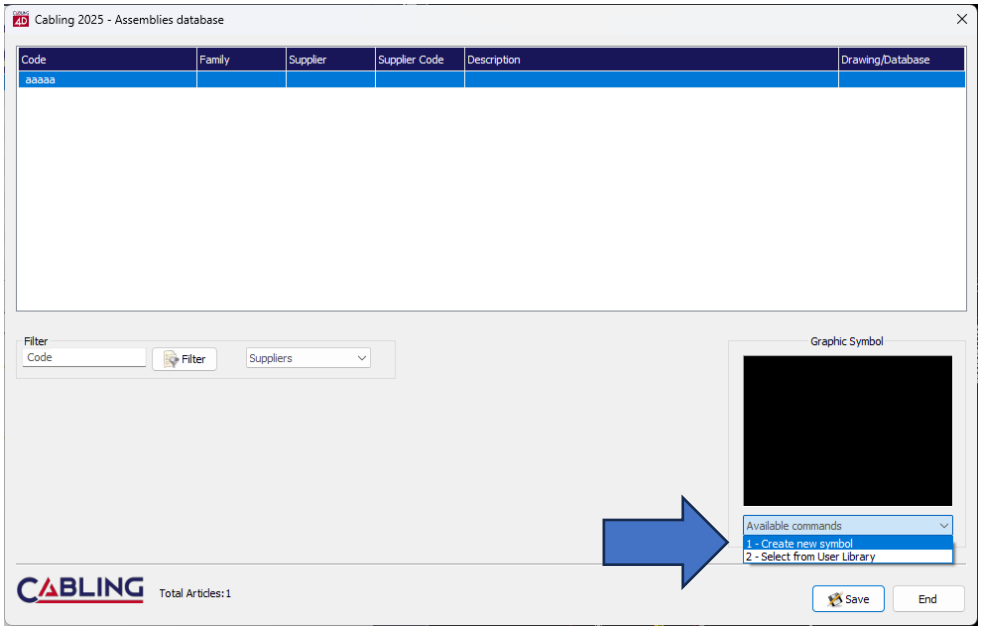
In the connectors window, if you select a single Pin from the list and add a Pole with 'Add', the usual window opens but with the new checkmark 'Insert Pin ID before the selected one'.

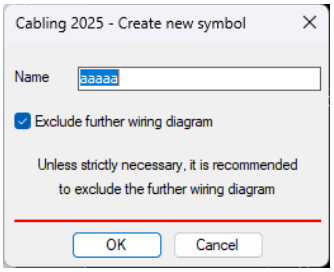




1.2 ASSEMBLIES – CREATE NEW SYMBOL

In the material archive, when creating a new symbol of an Assembly, a new dialog window is now opened with the new checkbox 'Exclude further wiring diagram'.

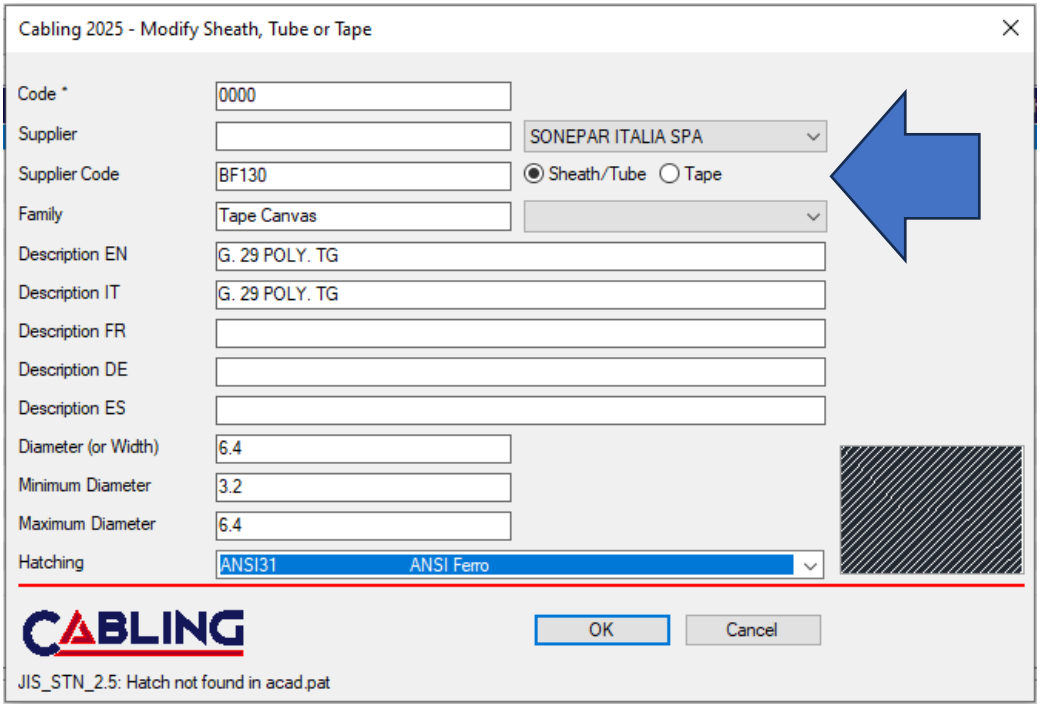




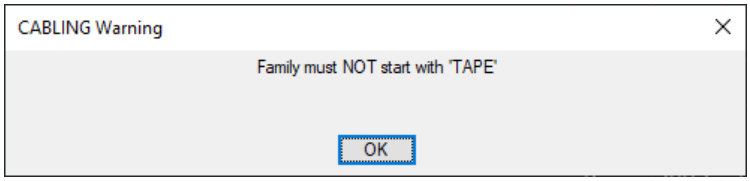
If the checkbox is enabled (it is by default), the wiring diagram entities will be omitted from the creation of the new symbol representing the assembly. If assemblies are used to be inserted as SubSet, this checkbox is useful.

1.3 ADD OR MODIFY SHEATH/TUBE OR TAPE

To facilitate the distinction between sheaths/tubes and tapes, the possibility of choosing which of the two categories the individual material belongs to has been inserted in the add and edit windows of the materials database.

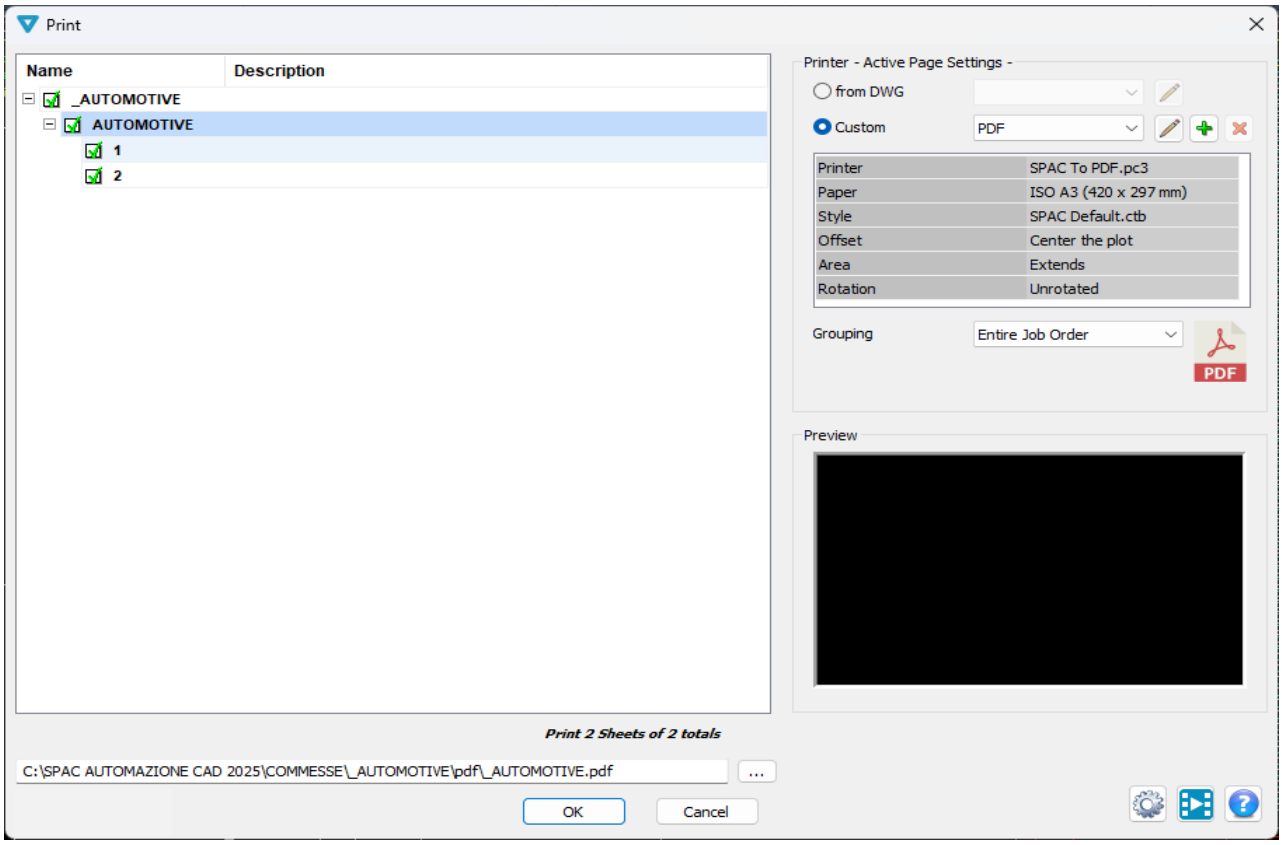


Selecting the 'Tape' category requires you to enter a value that begins with 'TAPE' in the 'Family' box.
This distinction was made to allow you to recognize a tape from a sheath/tube in CABLING processing.
Those who do not wish to touch their material database can continue to code all these materials under the 'Sheath/Tube' category.
These two new alerts may appear:



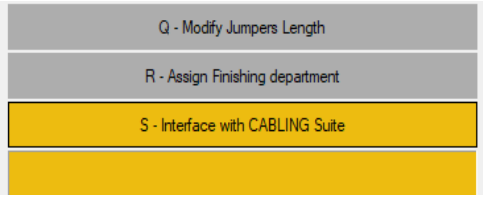
1.4 PRINT SHEETS

In automatic printing, the Job-orders to be printed are presented with the relative sheets. Since CABLING works by managing the single multisheet, when printing in the window only the sheets of the currently open multisheet are highlighted in green.
If the print is repeated in the same multisheet, the previously printed sheets are re-presented. Previously, if a print was performed on another multisheet, that list was re-presented and the user had to remember to re-select those of the current multisheet.

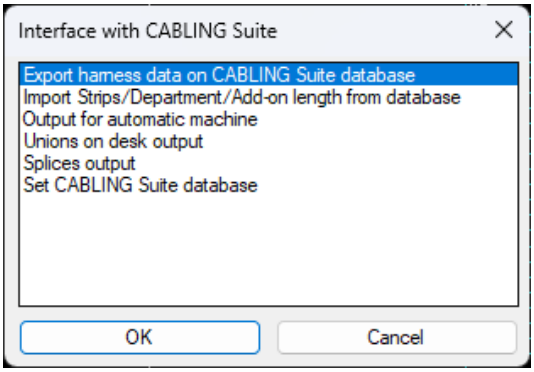


1.5 INTERFACE WITH CABLING SUITE

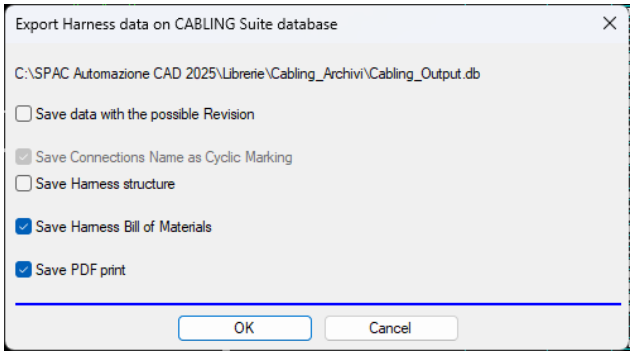
A centralized database has been created in which to save the harness data designed with CABLING 4D in order to use them with the new CABLING Suite (external program in Windows environment).
At the moment in CABLING Suite there are two applications available: CABLING 4P (for Production) and CABLING 4E (for Estimation) respectively to manage the harness data towards automatic cutting/stripping/crimping machines and to calculate production times.
The centralized database is an 'open' database in which you can, following our instructions, access to extract data useful to your company.



In the Industrialization menu using the button 'S – Interface with CABLING Suite' the window below opens:



With the option 'Export harness data to CABLING Suite database' the window below opens where you can choose what and how to export.



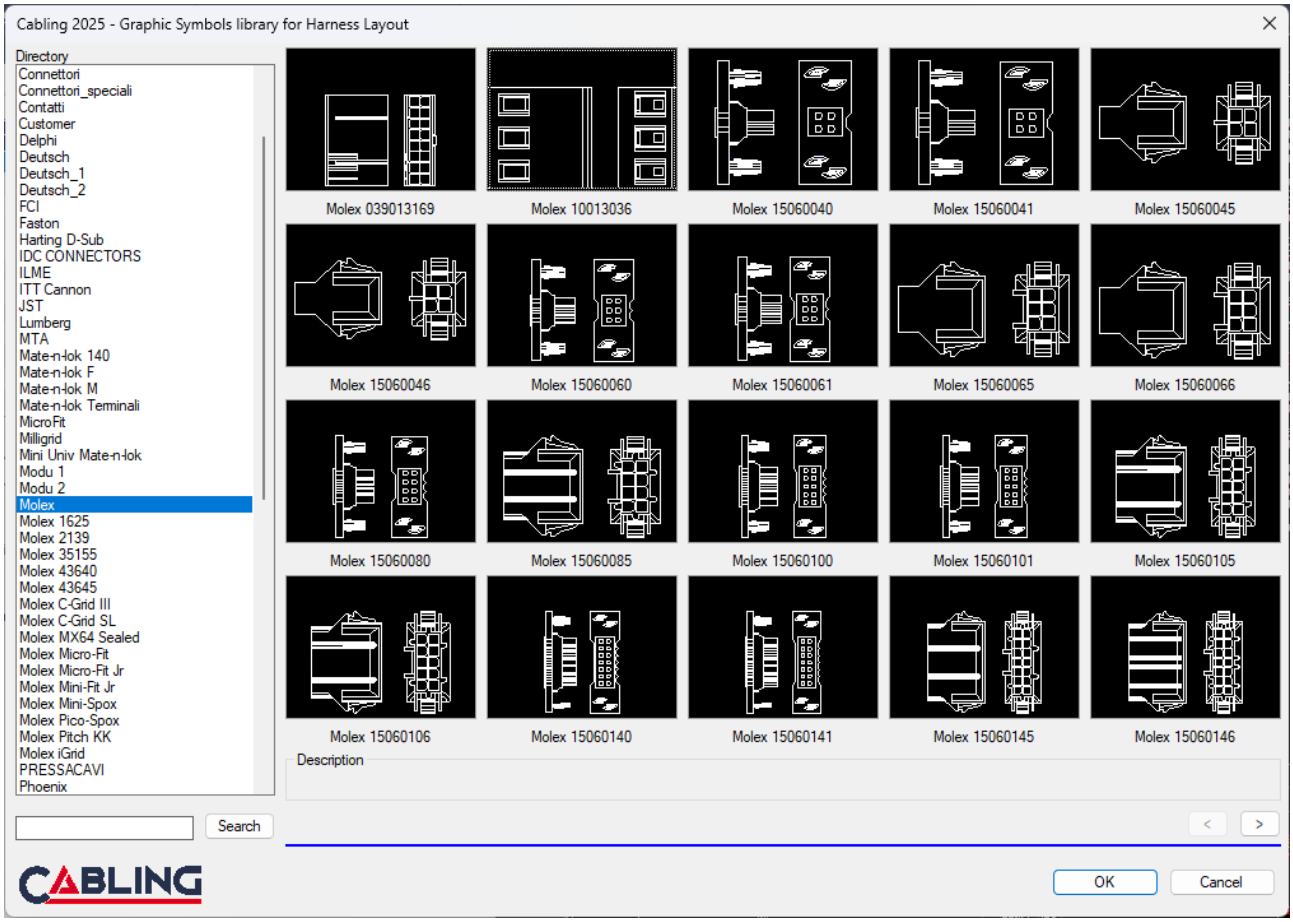
Before the first export it is necessary to set the CABLING Suite database (which must be called Cabling_Ouput.db) indicating its position in the work folders.

CABLING Suite, with the 4P application for the management of automatic machines, allows some changes to the cutting list exported from CABLING 4D. For this reason, the following items appear in the window with the interface commands:

- Import Stripping/Department/Add-on Length from database
  allows you to update an harness layout with information that has been modified in the database by Cabling Suite: starting and arrival stripping, connection add-on length and crimping department
- Output for Automatic Machine
  allows you to create a wires table with only the processed ones on automatic machines, starting from the data in the database by Cabling Suite
- Unions on desk table
  allows you to create a wires table of only the processed to be carried out at the bench (finishing) starting from the data in the database by Cabling Suite
- Output Splices
  allows you to create a Splices table starting from the data in the database by Cabling Suite.

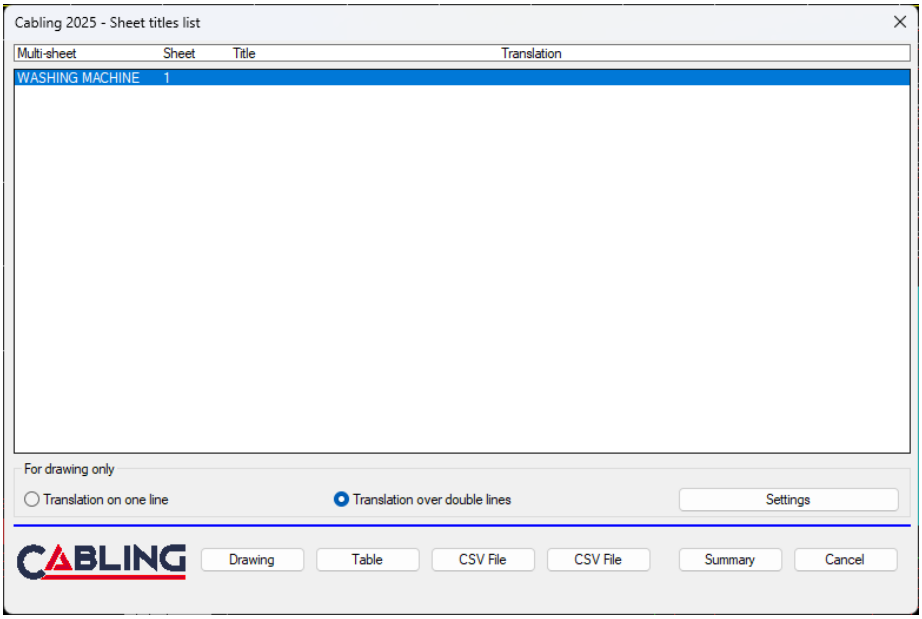
1.6 NEW GRAPHIC SYMBOLS IN CABLING_BLK_LIB

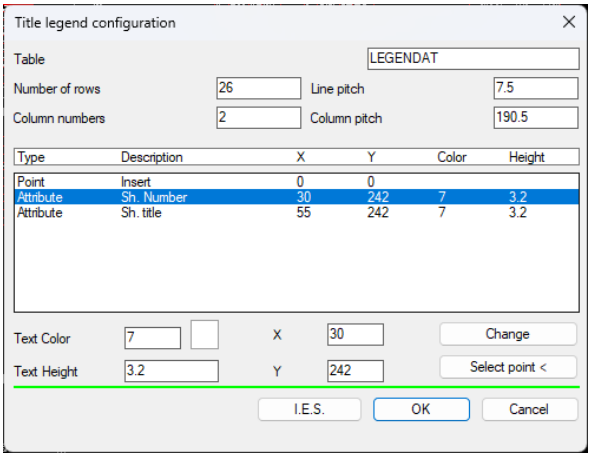
In CABLING 2025 we increased the number of blocks in the CABLING_BLK_LIB library. We went from about 3,000 symbols to about 3,500, many of which are MOLEX brand.
In addition, the library has been fixed by modifying obsolete codes of existing connectors.
Having an increasingly large library of available symbols in addition to our willingness to increase it on request remains one of our musts.



1.7 SHEET TITLES OUTPUT

The sheet title legend has been revised and in particular the possibility of saving the list in XLS format has been added.

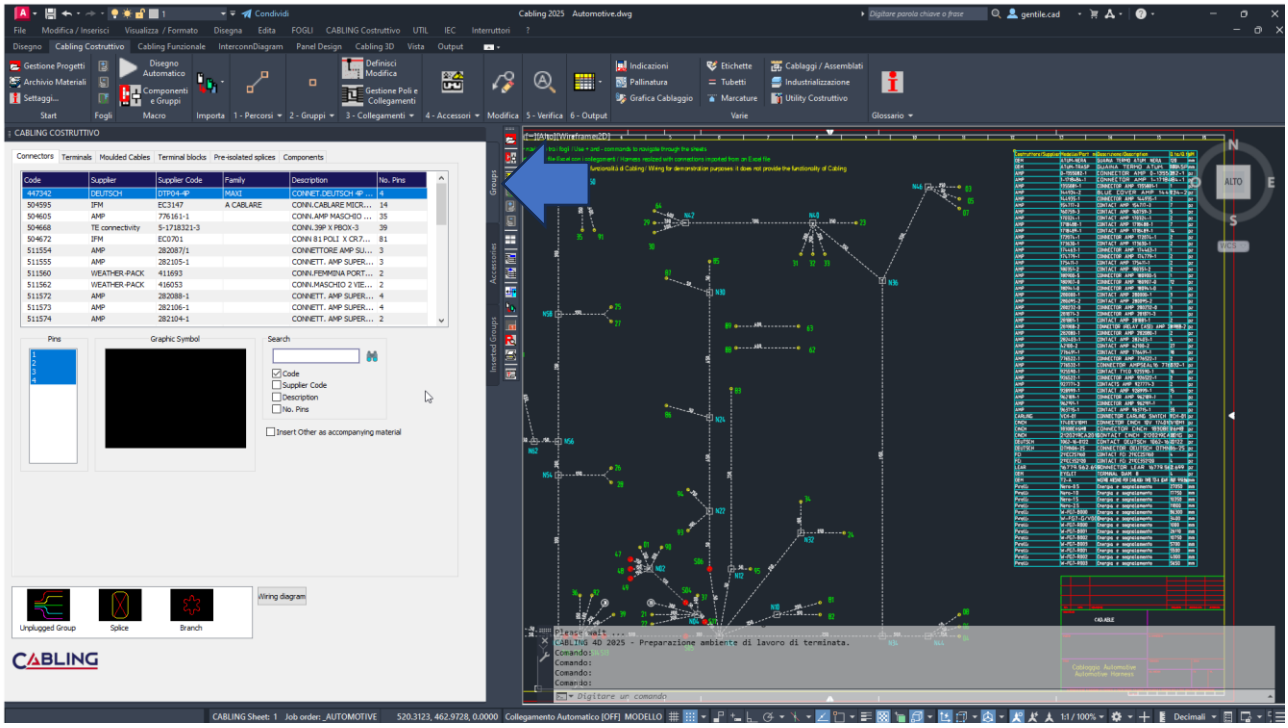




2 HARNESS LAYOUT

2.1 INSERTING GROUPS AND COMPONENTS

CABLING 2025 introduces a new method for inserting Groups into the harness layout via the new window below:



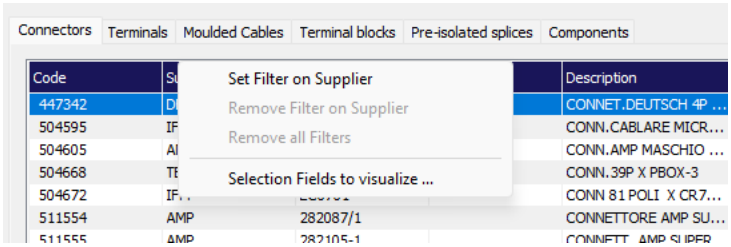
The window has the following features:

- It is resizable.
- It can be anchored to the left or right side of the drawing area.
- It can be minimized without being closed.
- It has three side tabs for three different modes: Groups, Accessories, and Inserted Groups.

In the Groups mode, the window displays a series of tabs at the top corresponding to the available material categories: Connectors, Wire Terminals, Moulded Cables, Terminals, Pre-isolated Splices and Components.

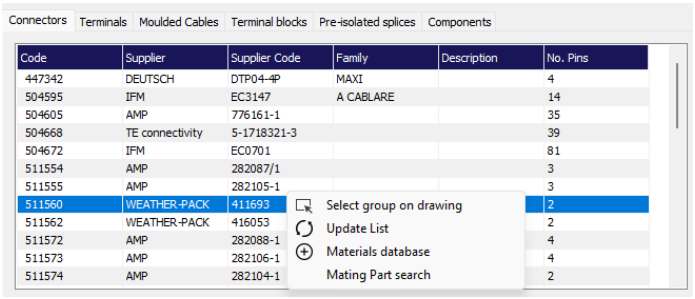
At the bottom of the window, three images are available for inserting Unplugged Groups, Splices and Branchings.
Below the materials list, there are other areas that depend on the material category: for example, for a Connector, the list of Pins, the image, and for all categories, an area dedicated to searching for the desired material using keywords.

It is also possible to set Filters by right-clicking on the material list titles.



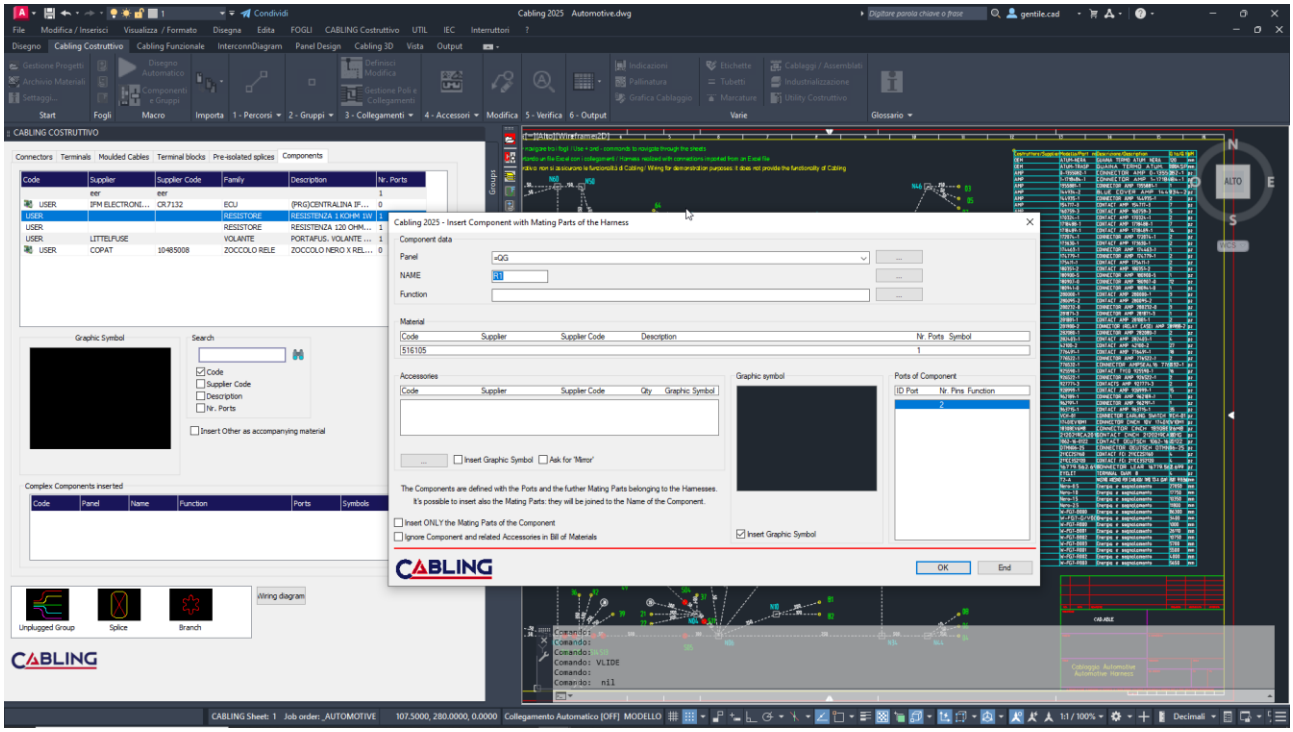
Right-clicking on the material list will open a context menu where you can:

- Select a material to place on the drawing.
- Update the material list if there have been any changes in the materials archive.
- Open the materials archive.
- For connectors and terminals, search for the mating part.



Additionally, two extra buttons:

- Wiring Diagram: to switch to the same window adapted for the this environment.
- Help (only for Components): To open a help file on how it works.

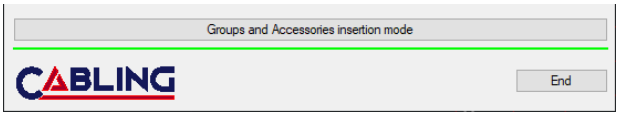


Inserting materials: Choose a material from the upper material list and insert it by dragging and dropping it with the mouse into the drawing area. You will then be prompted for additional information (e.g., name, function...) and asked for the insertion point on the drawing, as in previous versions. The same applies to the images for Free Groups, Soldering, and Branchings.

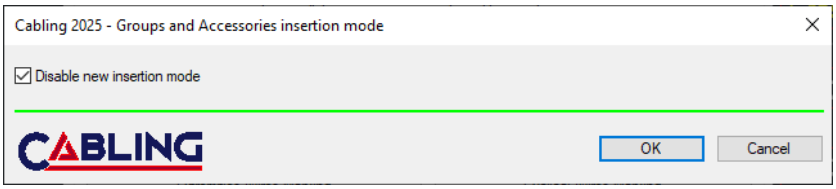
The checkbox ‘Insert as accompanying material’ allows you to insert the selected material not as a group but as an accessory.

If you do not wish to use this new mode of operation, you can revert to the previous mode as follows:

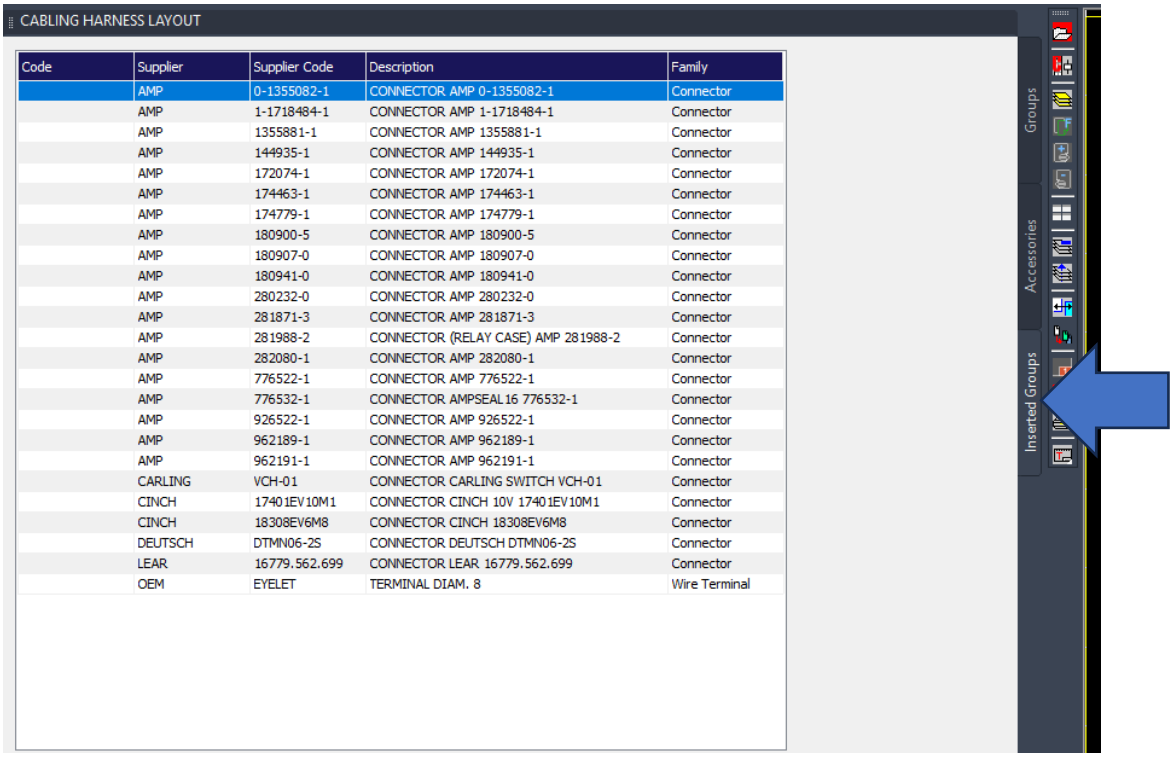
- Go to the Harness Layout environment settings.
- Use the button below.



Check the box for ‘Disable new Insertion Mode’.



In ‘Inserted Groups’ mode, the following window appears, listing the materials inserted into the current layout. In this window, you can also select a material and drag it into the drawing area to insert it.



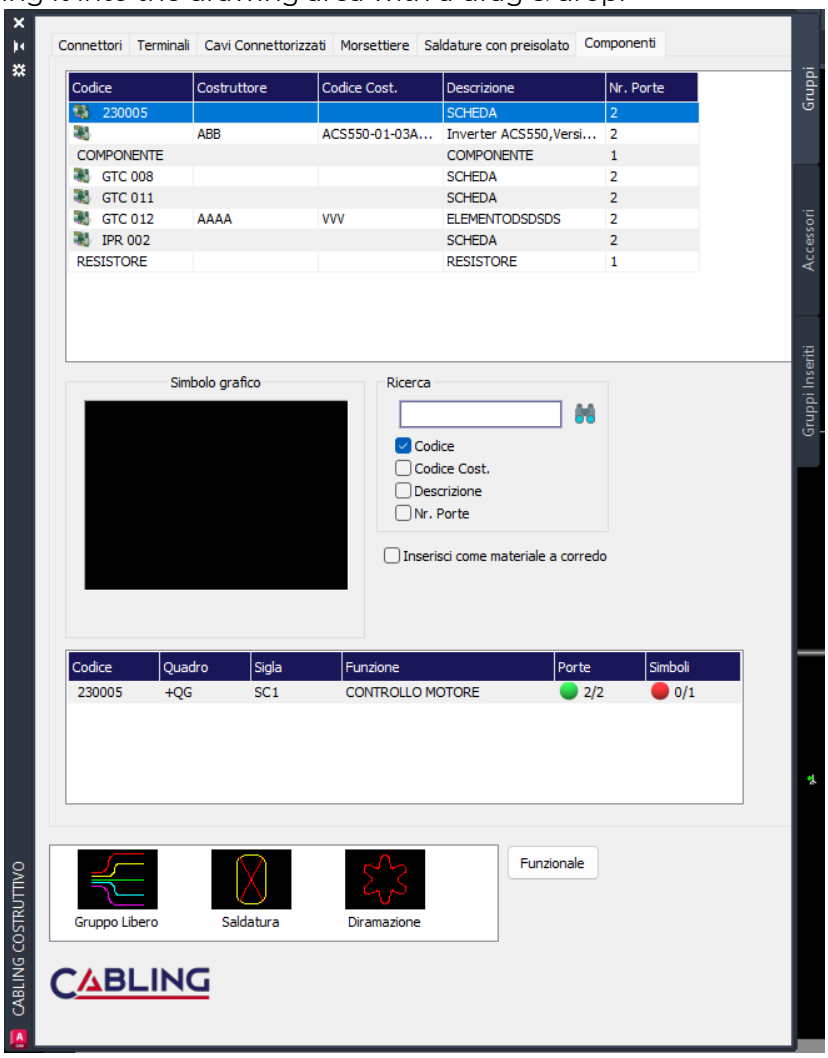
2.2 NEWS ABOUT COMPONENTS WITH CODE

In the Harness Layout environment a component consists of a graphic symbol and one or more ports.
There are three types of ports:

- Ports with mating part
- Ports with multiple pins
- Sequence of single pins

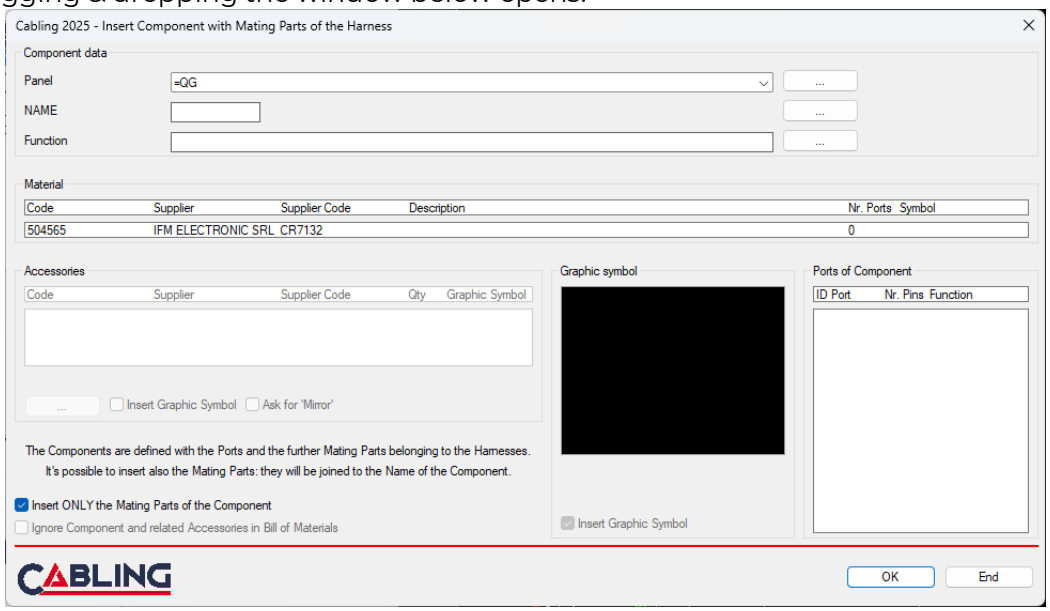
For each component to be inserted, the Panel, a unique Name (which cannot be repeated) and an optional function are required.
For components with multiple ports or with only one port with mating part, a name and a function (optional) will be required for each port.
In the case of simple components, the name of the component will correspond to the name of the single port without mating part.

In the dockable window, select the top tab 'Components', choose a material from the top list and insert it by dragging it into the drawing area with a drag & drop.



With the exception of simple components, all others will be inserted into the 'Inserted Components' list at the bottom of this window.
The reason for this list is to keep an eye on the list of Ports and graphic symbols inserted in the drawing (Ports and Symbols columns) where if you find green dots it means that the component has been completely inserted. If it is not, you can drag the selected component from this list into the work area to complete the insertion.
For example, if you have inserted a port of a component that has two ports, you can select it from the lower list and drag it into the drawing area to insert the second port.

After dragging & dropping the window below opens:



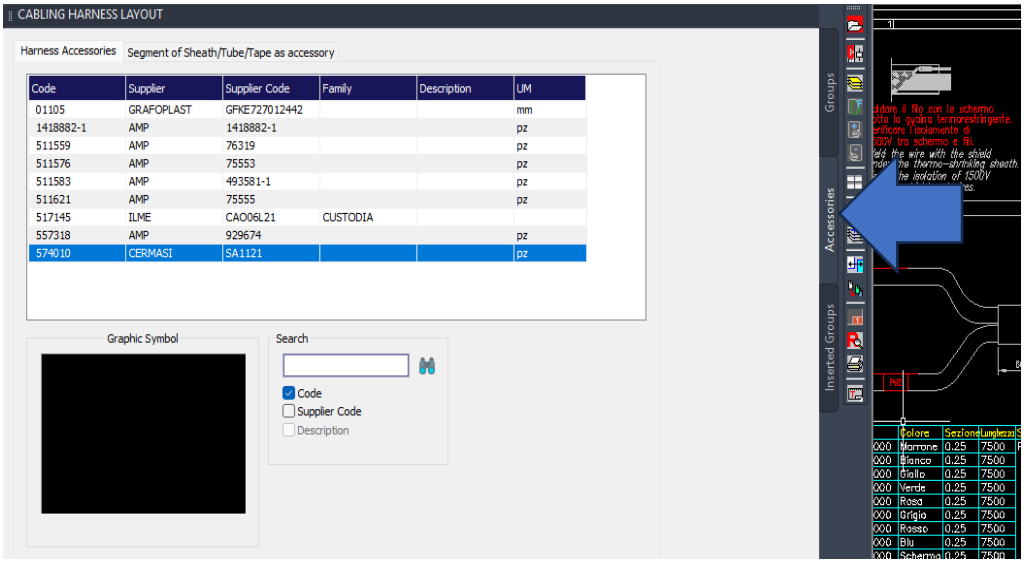
If after inserting the name you activate the checkbox 'Insert ONLY the Mating parts of the Component', the component will not be inserted and you will be asked to insert the ports, with or without mating parts. Otherwise and if the relative graphic symbol is defined, the component will be inserted and the ports will be inserted subsequently.

The component (even if not inserted) is saved in the drawing and considered a Usage with a specific panel, name and function.

The Name of the Ports of a component are proposed in this way:
Component Name + ID of the port defined in the material database separated by a space.
The Function eventually defined in the material database is proposed.
Obviously you can change the Name and the Function as you like, with the exception of the Panel which will remain the one defined in the component.

2.3 INSERT ACCESSORIES

CABLING 2025 has introduced a new way to insert Groups and Accessories into the harness layout via the new window below:



Activate the window to insert Accessories using the corrispondent side tab.

The window has two upper tabs to select the type of accessory:

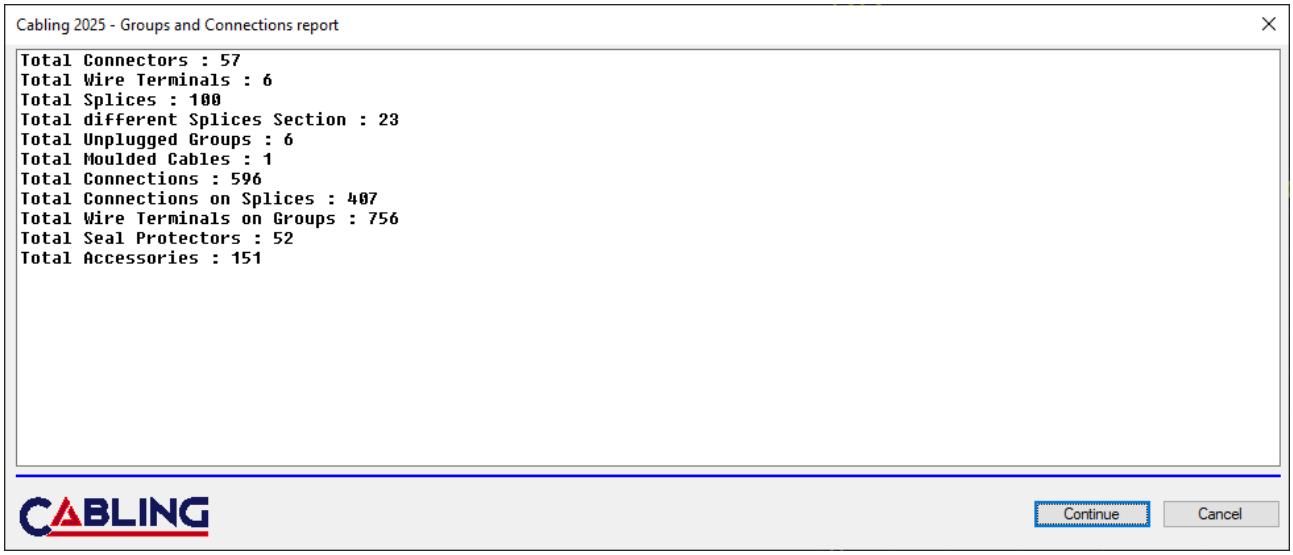
- Harness accessories
- Pieces of Sheath/Tube/Tape as an accessory.

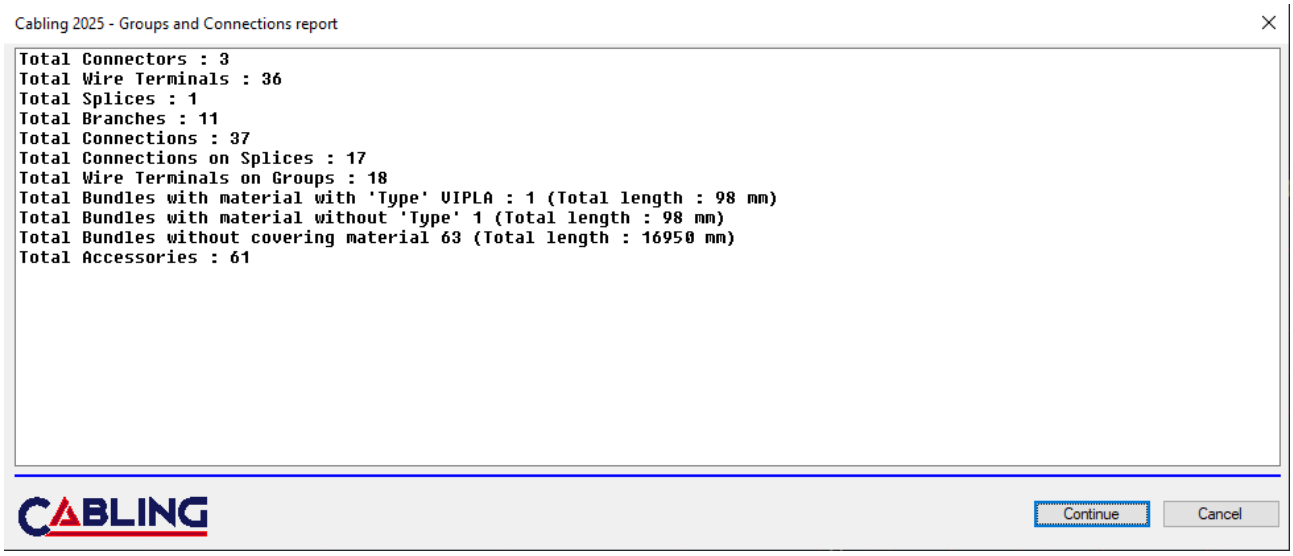
Also in this window, choose a material from the upper materials list and insert it by dragging it with the mouse into the drawing area (drag & drop): the other necessary information will be requested with a further window.

2.4 REPORT GROUPS AND CONNECTIONS

The report has been enriched with new information:

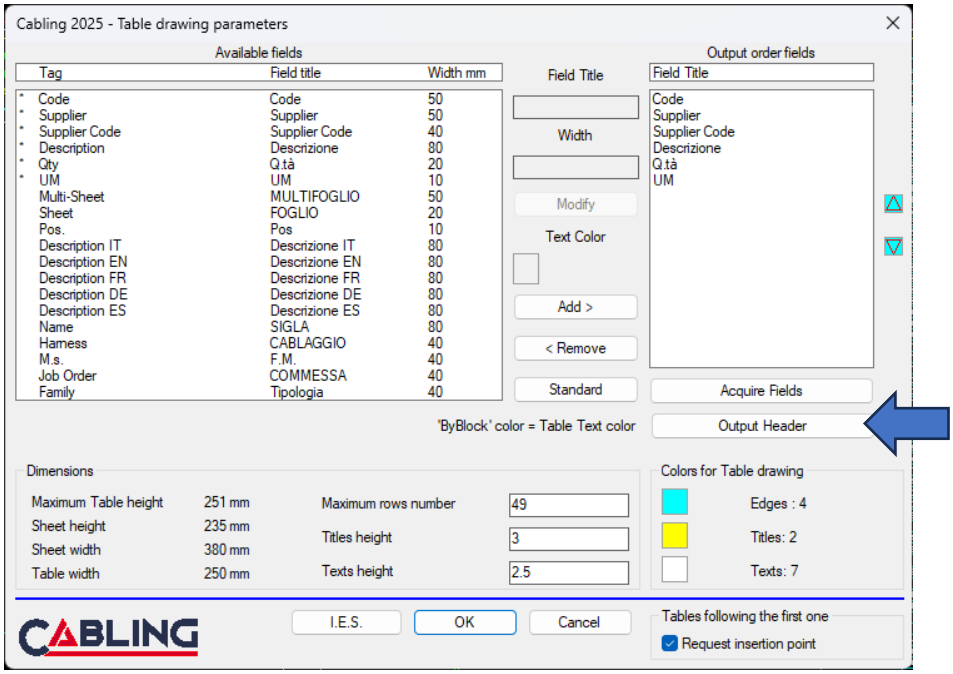
1. Splices are divided from those with pre-insulated
2. For sploces without pre-insulation it is possible to have a count of how many different sections (sum of the sections of the connections that are connected to the individual splices) are present on the harness
3. Branches are counted
4. The Bundles are counted divided by: taped, without material and with material, the last one divided by Type (if defined in the materials archive).



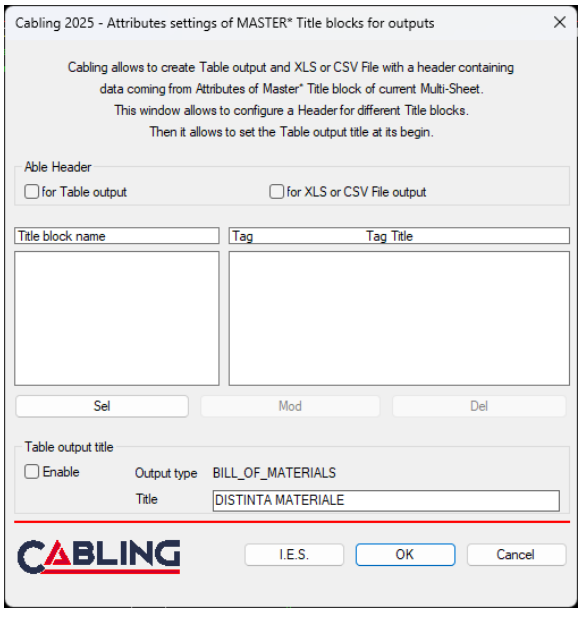


2.5 OUTPUT HEADERS

It is possible to insert a title at the top of the outputs. To configure this possibility use the 'Output Headers' button in the settings of the table or file outputs.



CABLING allows you to create outputs in Table and XLS or CSV files with a header whose data is taken from the attributes of the Master* Title Block of the current Multisheet. This window allows you to configure this header even for different title blocks.



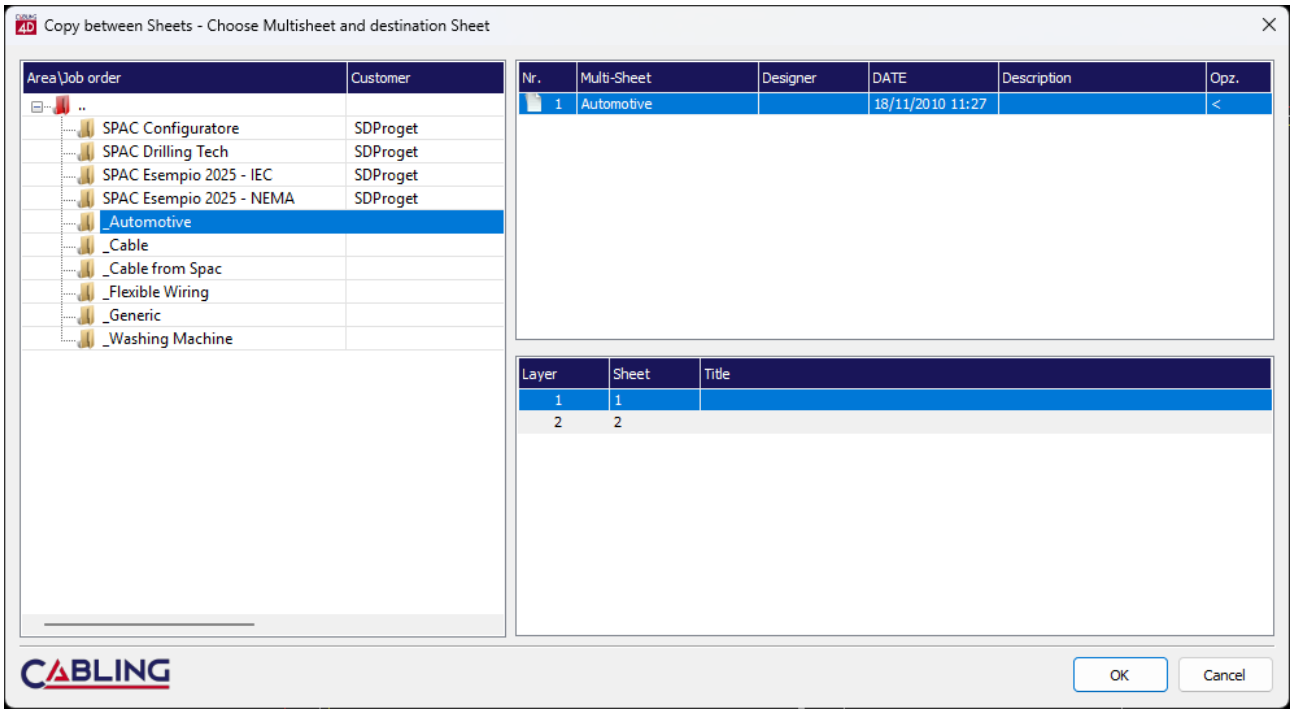
Only for table outputs you can enter a title, for example BILL OF MATERIALS
The 'Title' is maintained, it will not be necessary to set it when creating new job-order or new multisheets.

DISTINTA MATERIALI

Codice	Costruttore	Modello	Descrizione	Q.tà	UM
C23382			CAVO CAN ISO11898 2X0,5 P/F	0.31	m
CU-00.5-B			CAVO SEZ.0,5 BIANCO	0.475	m
CU-01.0-CG			CAVO SEZ.1 ARANCIO GIALLO	0.345	m
CU-01.0-HB			CAVO SEZ.1,0 GRIGIOBIANCO	0.345	m
CU-01.0-N			CAVO SEZ.1,0 NERO	0.234	m
CU-01.5-BN			CAVO SEZ.1,5 BIANCONERO	0.255	m
CU-01.5-NG			CAVO SEZ.1,5 NEROGIALLO	0.355	m
CU-01.5-RG			CAVO SEZ.1,5 ROSSO-GIALLO	0.355	m
CU-04.0-B			CAVO SEZ.4 BIANCO	0.345	m

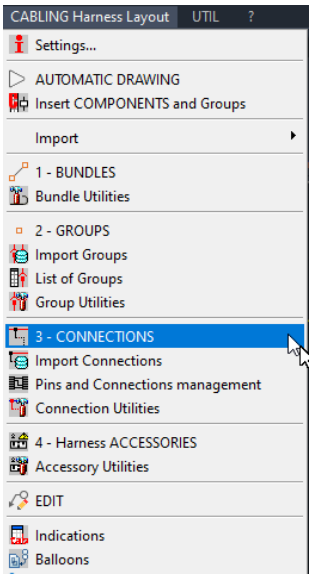
2.6 COPY BETWEEN SHEETS

The command that allows you to copy an harness to another sheet of the same multisheet or another one has now been revised to allow easier navigation between Areas and Job orders. With the new window that opens after selecting the elements to copy, you can navigate the Job Orders and choose Multisheets and Destination Sheet.



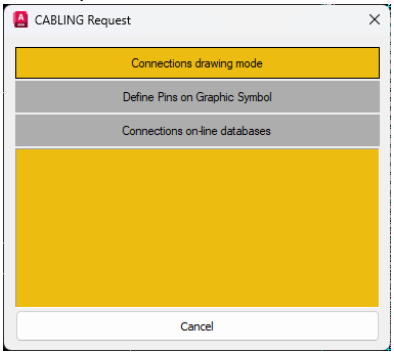
As in the previous version, if the drawing has been modified you are asked whether to save it and you are also asked whether to copy the Connections between the selected Groups.

2.7 CONNECTIONS

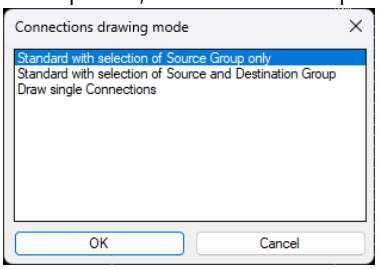


When launching the command by pressing Enter to the question on the command line

the revised CABLING options window opens.



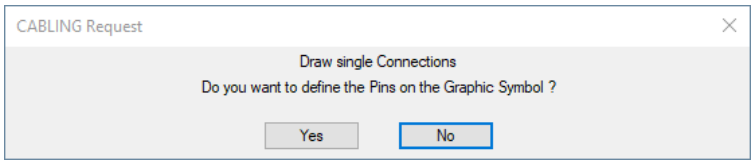
With the 'Connection Drawing Mode' option, this window opens:



'Draw Single Connections' now becomes a mode that remains modal for the entire work session, unless you change it with the same menu or reopen the drawing.

This change was made necessary by the growing number of users who use the 'Draw Single Connections' mode.

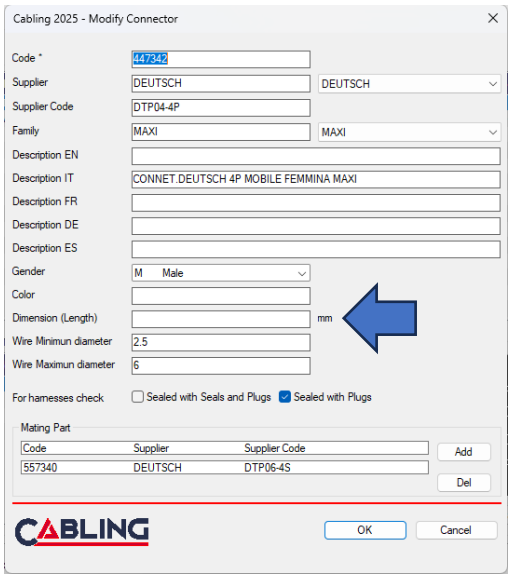
When designing with Single Connections, if you select a connector that does not have defined pins on the graphic symbol, the following question is asked:

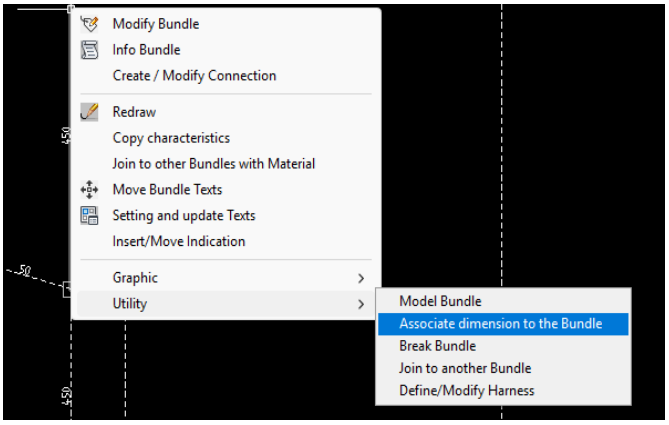


If you press yes, the Pins definition window on the graphic symbols will open, where you can specify the reference points of the graphic symbol where the single connections should arrive.

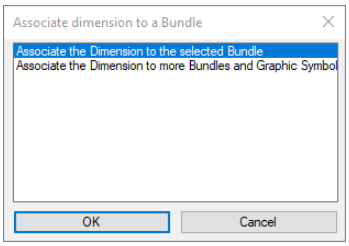
2.8 ADDED NEW DIMENSION FIELD

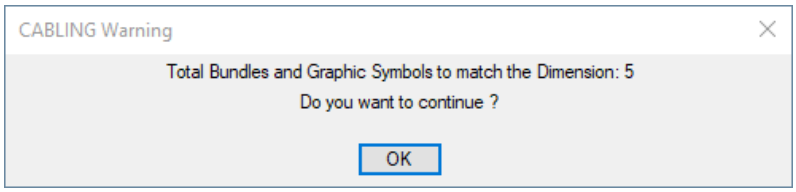
For Connectors and Molded Cable, the new dimension field is now available in the Cabling materials database, where you can indicate the length of the connector or molded cable.

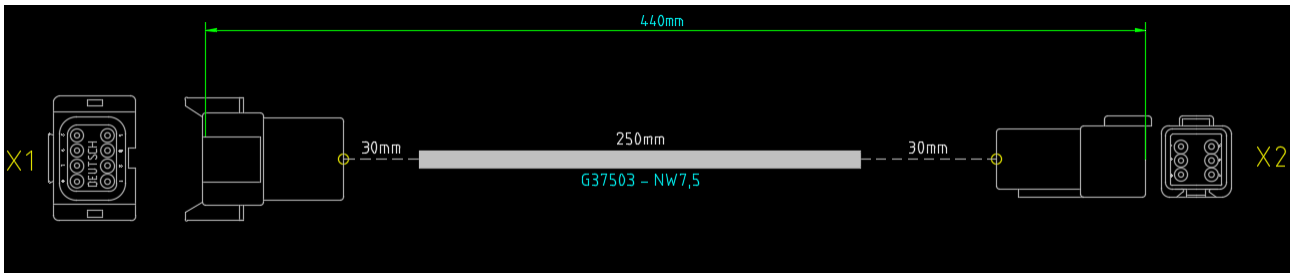




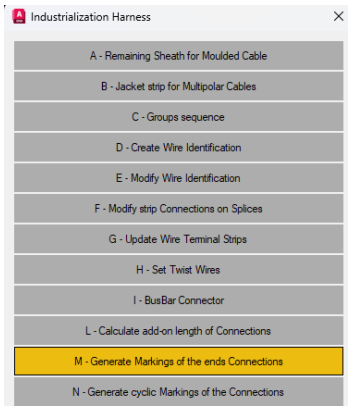
This information can be used to include, in the cable and harness layout, the assignment of multiple Bundles to a dimension and have the total size of the cable including the lengths of the connector or molded cable. You are asked to select the graphic symbols of the connector or molded cable and are asked for confirmation before the assignment.

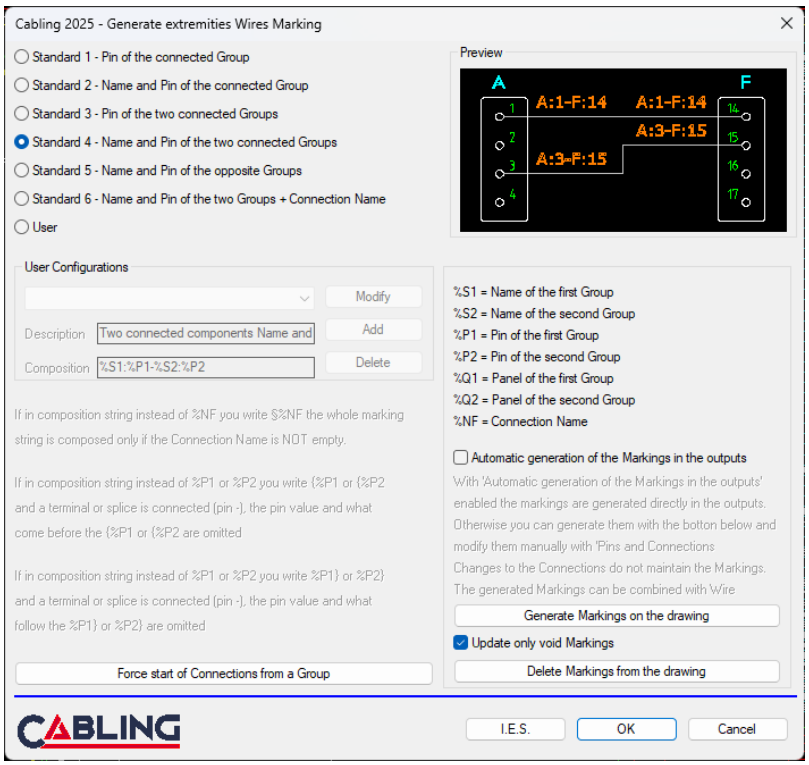


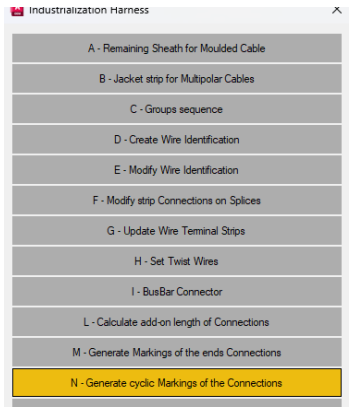


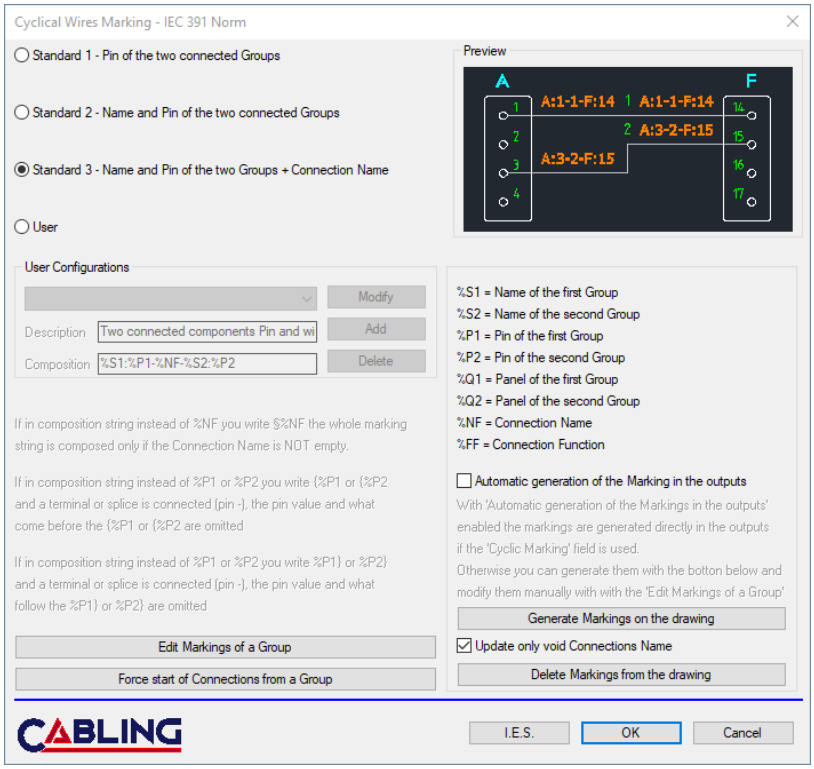


2.9 GENERATE CONNECTION MARKINGS









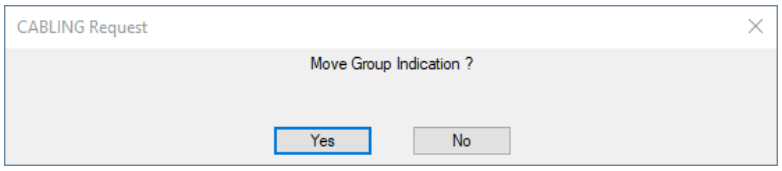
Important news in the connection markings, both those at the ends and those cyclical along the wire:

- The dialog windows have been improved
- The cyclical markings are no longer saved as a connection name but as separate information
- The cyclical marking information can now be viewed, in addition to the group indications, on all CABLING outputs including the graphic ones (tag %MC% in TblWire* blocks)
- For the cyclical markings, the 'Edit Group Markings' button has been added in the window dedicated to them, which allows you to modify, add or delete the marking texts. For the markings at the ends, the commands '3 – Connections' and 'Pins and Connections Management' continue to be used.
- On both markings (ends and cyclical), the 'Force connections start from a Group' button has been added, which allows you to invert (if necessary) the connection. Where start and end group information is involved this allows the markings to be generated in the desired sequence/direction
- Markings can also be exported to CABLING 4P (Cabling for Production) for inkjet printing with automatic cut/strip/crimp machines.
- Cyclic markings are intended for inkjet printing on wire only, end markings for both printing and wire markers/labels.

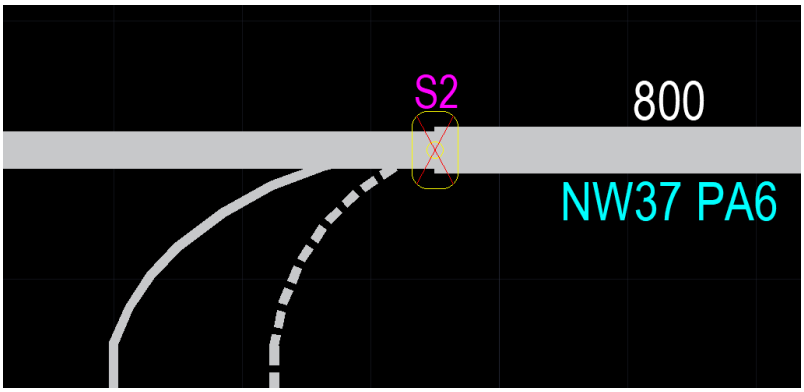
2.10 MOVE GROUP

Two new features have been added:

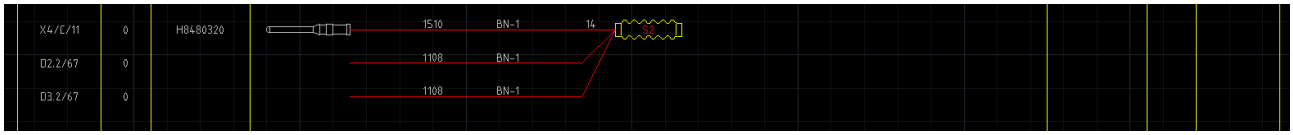
- It is possible to move the Splice group also on a Bundle object of union
- After moving the group the question is asked:



2.11 SPLICES OUTPUT



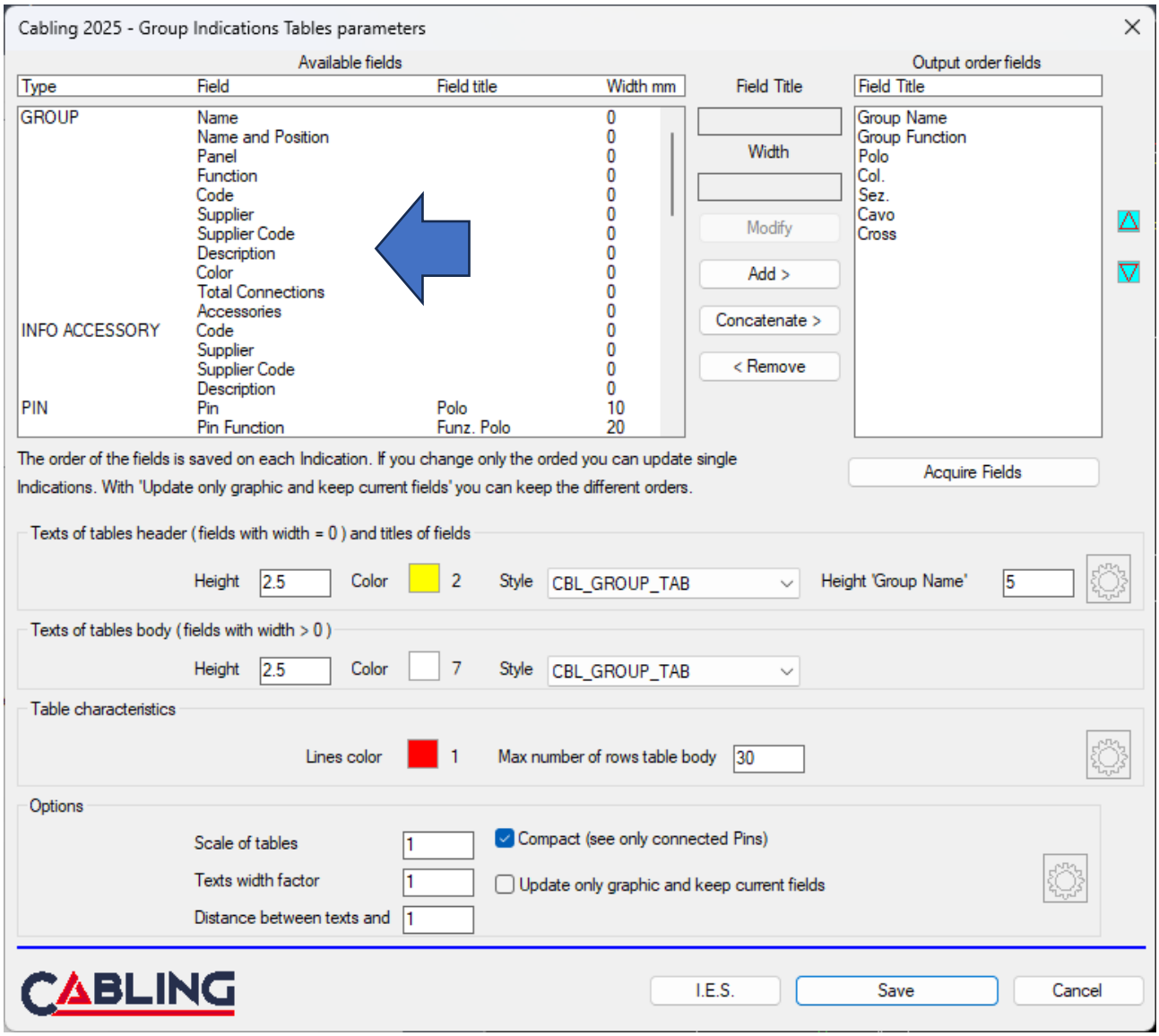
In the presence of a splice (S2) at a point where more than 2 Bundles arrive, up to now the output did not calculate the left and right directions of the connections.



Now the evaluation is done on the Bundles where the connections actually pass: if they are 2, the left and right directions are calculated.

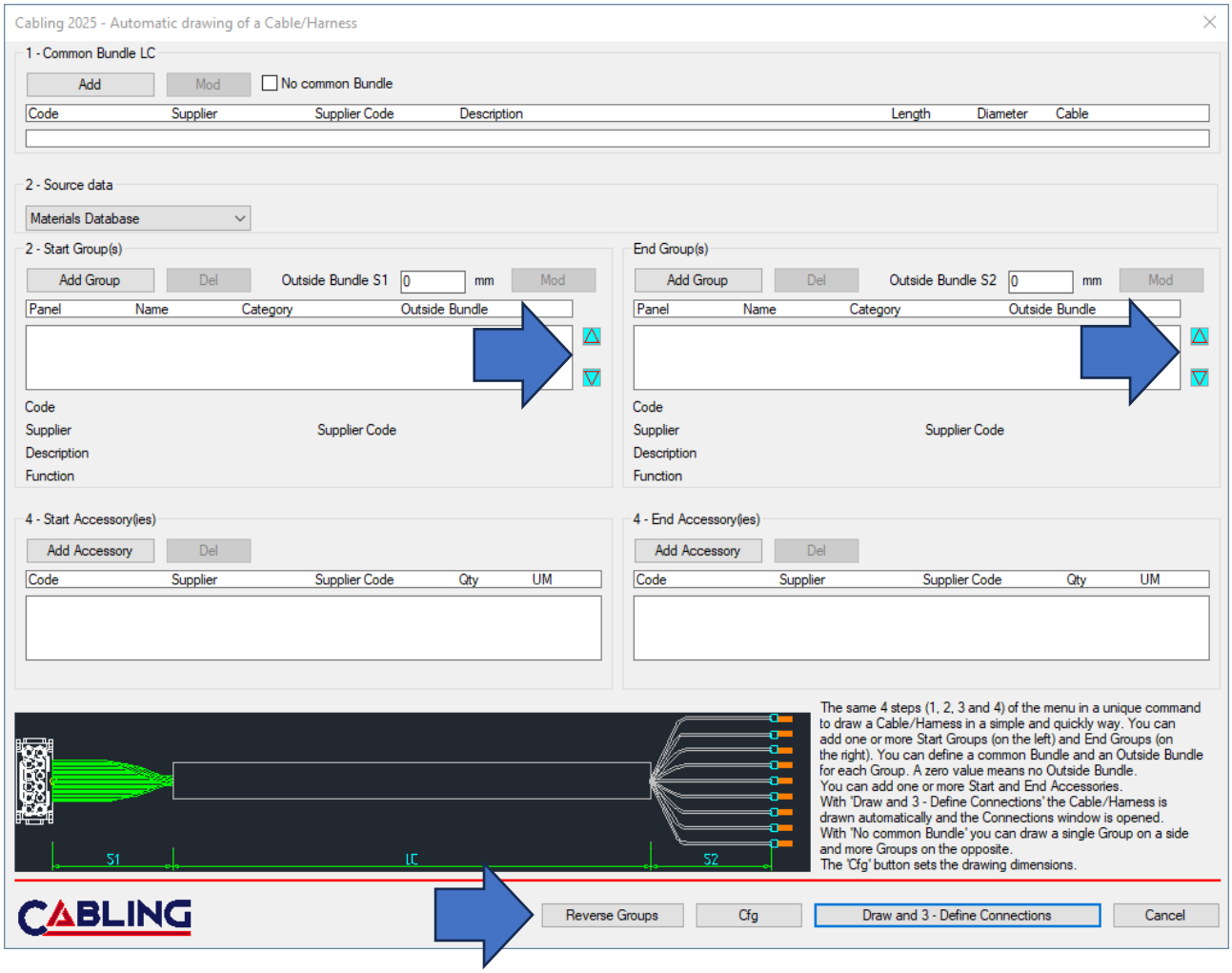
2.12 GROUP INDICATIONS SETTINGS

The many fields available for these tables have now been grouped by type.

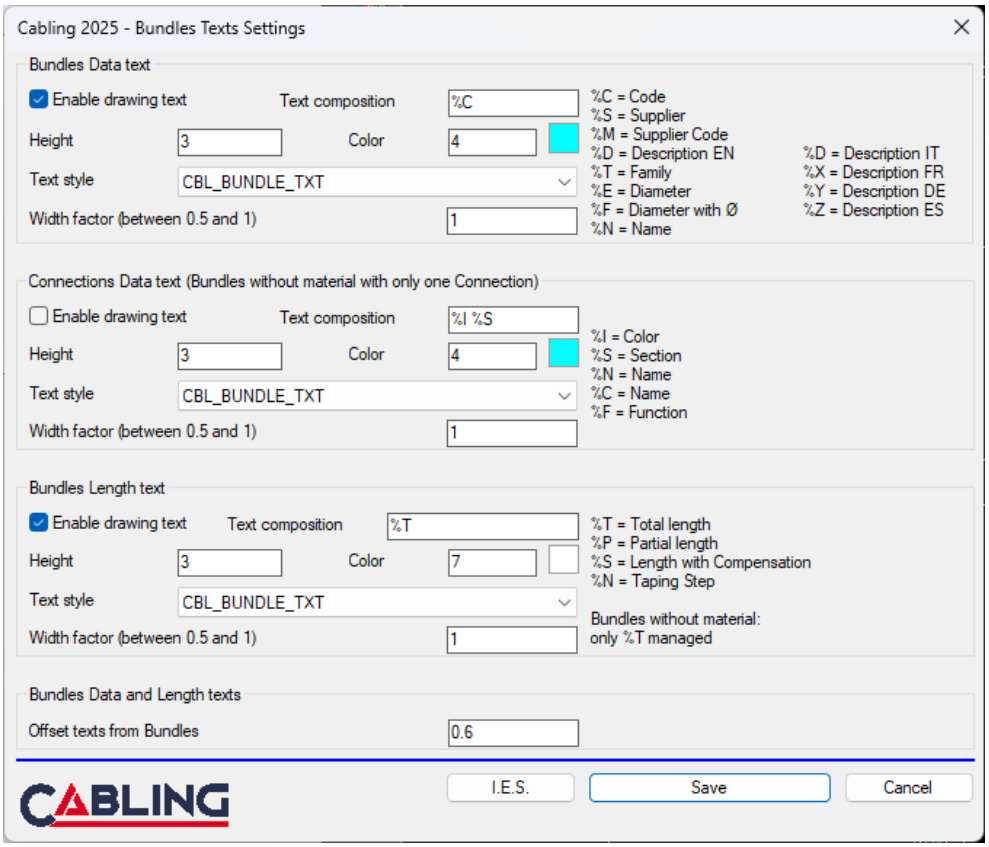


2.13 AUTOMATIC DRAWING

New controls have been added to the window to make it easier to use during modifications. After defining multiple starting groups and multiple destination groups, you can order them differently with the arrows next to their list. You can also completely invert a Cable/Harness.



2.14 BUNDLE TEXTS SETTING



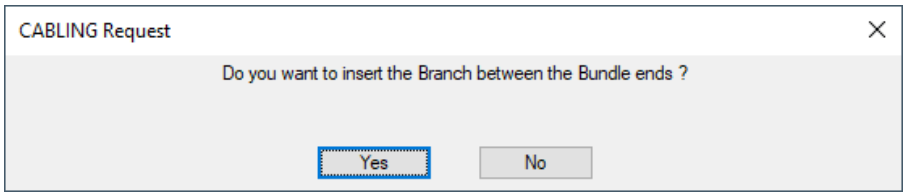
New configurations have been added:

- %W for English description
- %X for French description
- %Y for German description
- %Z for Spanish description
- %F for diameter with ⌀

With %F, if there is a taping, in addition to the diameter set by the user, the taping step is also inserted.
If %%C is inserted in the marking string, it is now accepted and interpreted as ⌀

2.15 INSERT BRANCHES

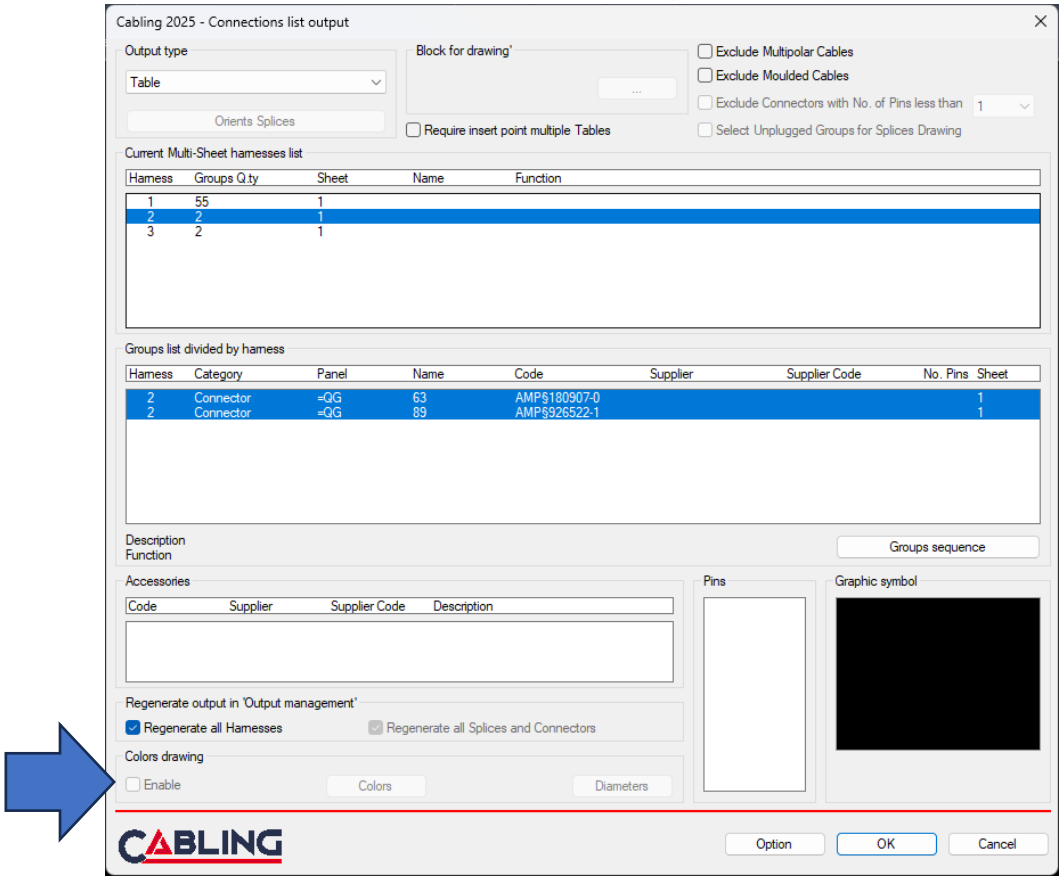
When inserting Branches the following question is now asked:

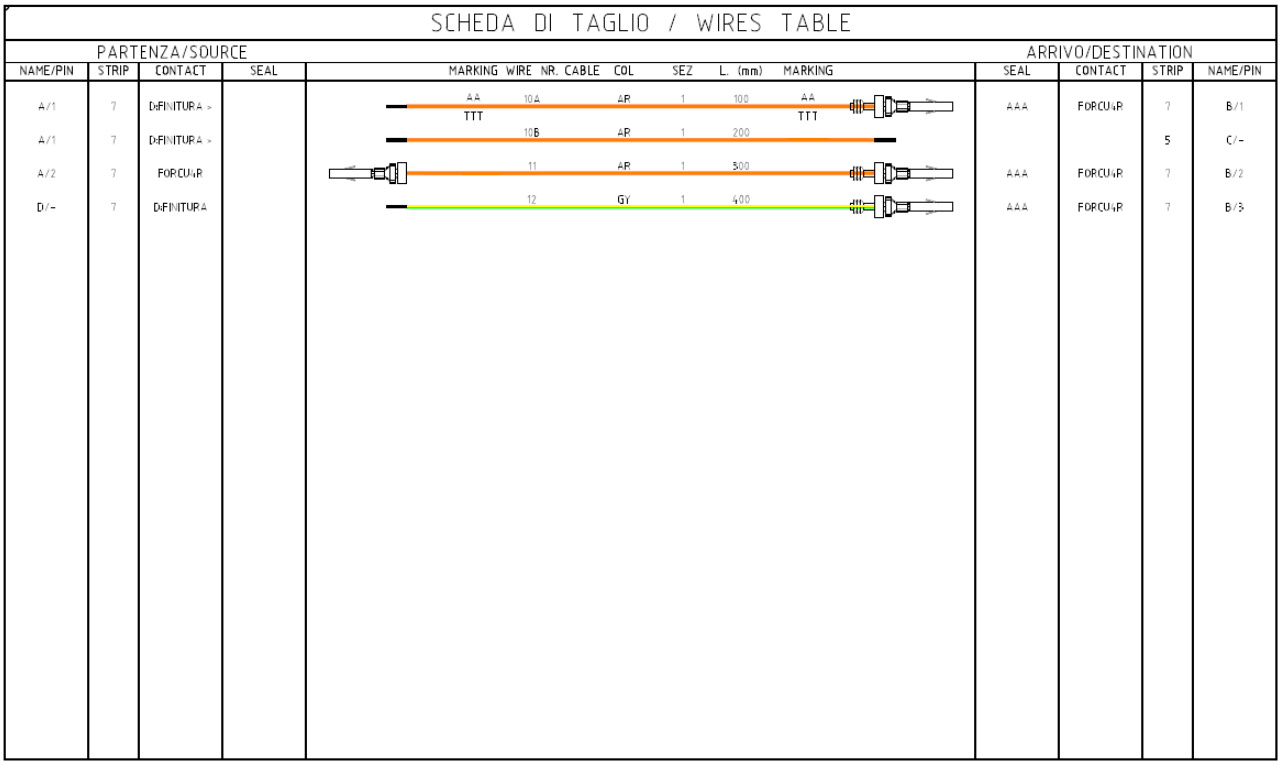


This allows you to break the Bundle and insert the Node in one go, speeding up the work.

2.16 WIRE COLORS ON TABLE TBL_WIRE*

CABLING 2025 allow to create Wires cutting table using the colors of them, like in the example.

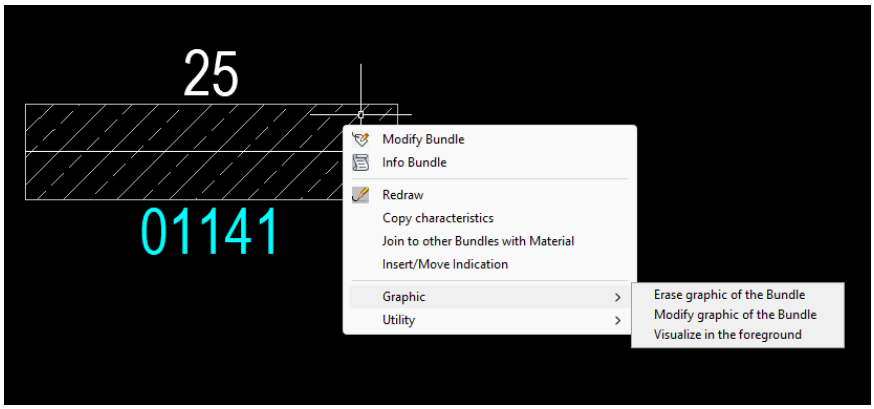




2.17 TABLE TBL_WIRE* SCALE

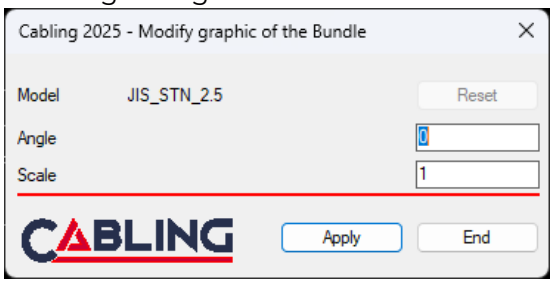
With CABLING 2025 it is also possible to scale the outputs created with the TBL_WIRE* Blocks, such as the cable conformation table and the Semi-finished Table, Splices Table and Connector Connections outputs.

2.18 EDIT BUNDLE GRAPHICS



On Bundles with covering material, in the presence of the relative Bundle graphics, a new item has been added to the context menu: 'Edit Bundle Graphics'.

This new option opens the following dialog box:



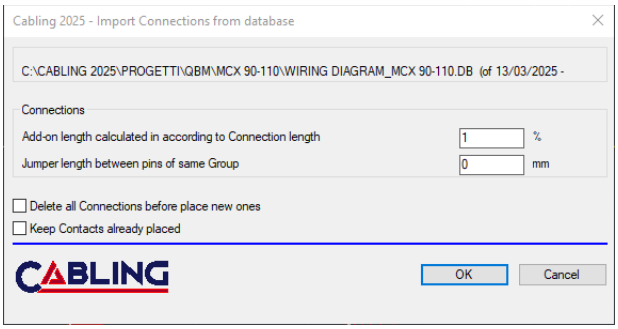
It displays the hatching pattern, angle and scale. Remember that the path graphics are generated with the angle at zero and with the scale set in Settings → General settings → Hatching scale factor.
By changing the angle and scale values and pressing the 'Apply' button, the hatching is modified and the values are stored on the Bundle. This means that the new graphics of the selected path will be maintained even if the graphics are regenerated.
To eliminate the forcing of the two parameters, use the same window and use the 'Reset' button, which will be enabled automatically.

These forcings allow you to create specific hatching graphics for individual Bundles by playing with angles and scale, making the drawing even clearer and more comprehensible to read.

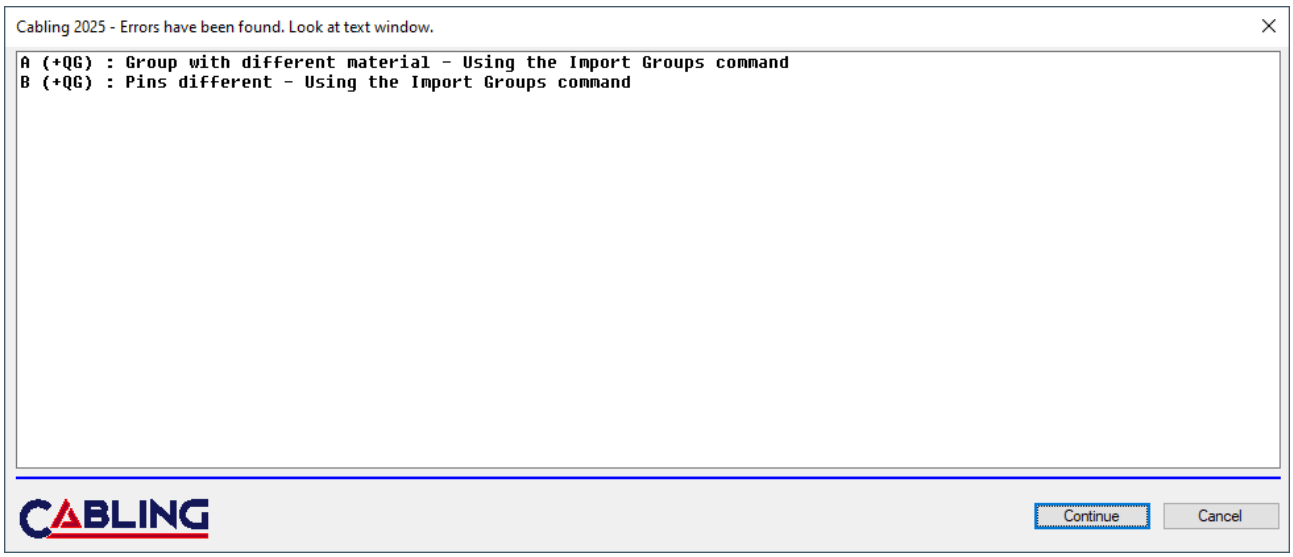
2.19 IMPORTING CONNECTIONS INTO THE HARNESS LAYOUT

When using the 'Import Connections' command in the harness layout, it is assumed that the user has first imported the groups: importing groups means not only inserting them but also checking that they are correct with respect to the data source, whether it is an imported file or a electrical diagram.

To give the user greater security when import the connections without having checked that the groups are correct, an additional check has been inserted at the start of the command.



After the previous window, the checks are carried out and in the event of an error, a further dialog box opens with their list, asking the user whether to continue or not. The errors are also written to the AutoCAD text window.



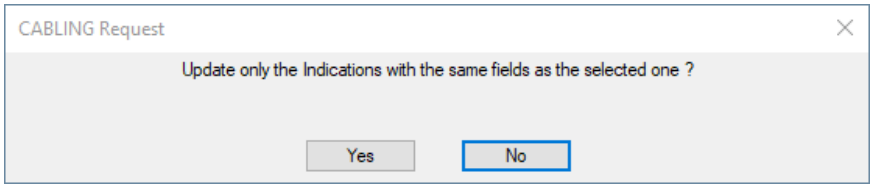

```
Comando:
Selezionare un Gruppo di un Cablaggio:
Percorso non appartenente a nessun cablaggio:
Foglio: 1 - Posizione: (152.50, 180.00, 0.00) <--> (237.50, 180.00, 0.00)
B (+QG) : Gruppo con materiale differente - Utilizzare il comando Importa Gruppi
A (+QG) : Poli differenti - Utilizzare il comando Importa Gruppi
```

2.20 BUNDLES UNION CONTROL

More controls are now made by CABLING to check and correct the sequence of Bundles connected together with a Union.
Ricordiamo che l'unione tra Percorsi con materiali serve ad avere un'unica lunghezza e a effettuare un report corretto del taglio guaine.
We remember that the union between Bundles with materials is used to have also a single length and to carry out a correct report of the sheath cutting.

2.21 UPDATE OF GROUP INDICATIONS

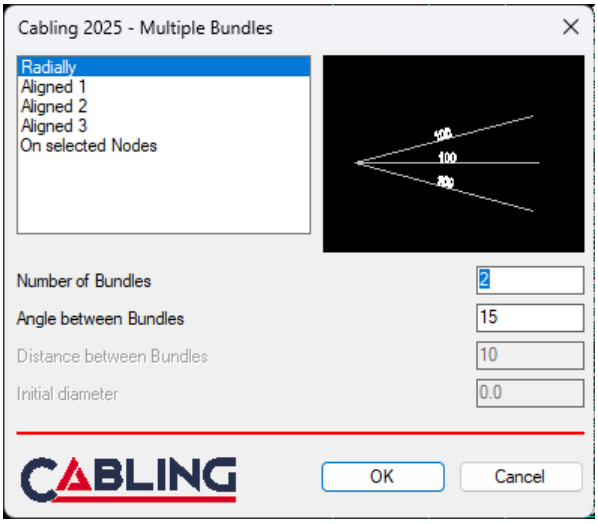
In Cabling, it is possible to assign specific fields to the indications of the individual Groups. In this case, modifying the fields and then updating the indications would make all the indications of the layout unique, unless you use the selection modification. Now, if you activate the modification of the settings from the right-click menu of an indication, after the field modifications and before the update this question may appear:

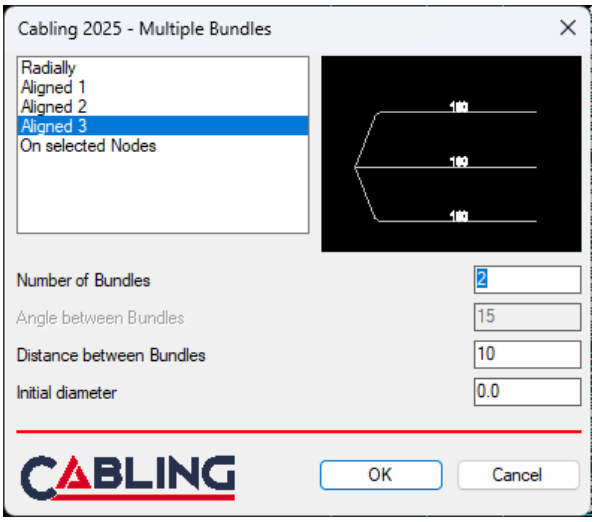


The question is not asked if the drawing contains only Indications with homogeneous fields.

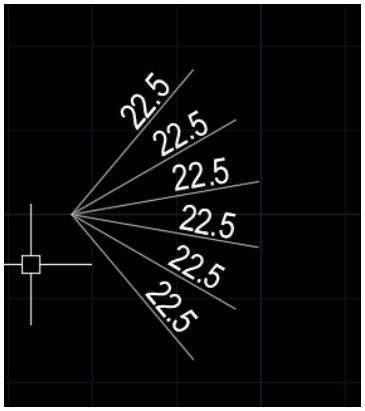
2.22 MULTIPLE BUNDLES DRAWING

In Cabling the Multiple Bundles drawing window has been completed with the relative images of the result that will be obtained in the various modes.

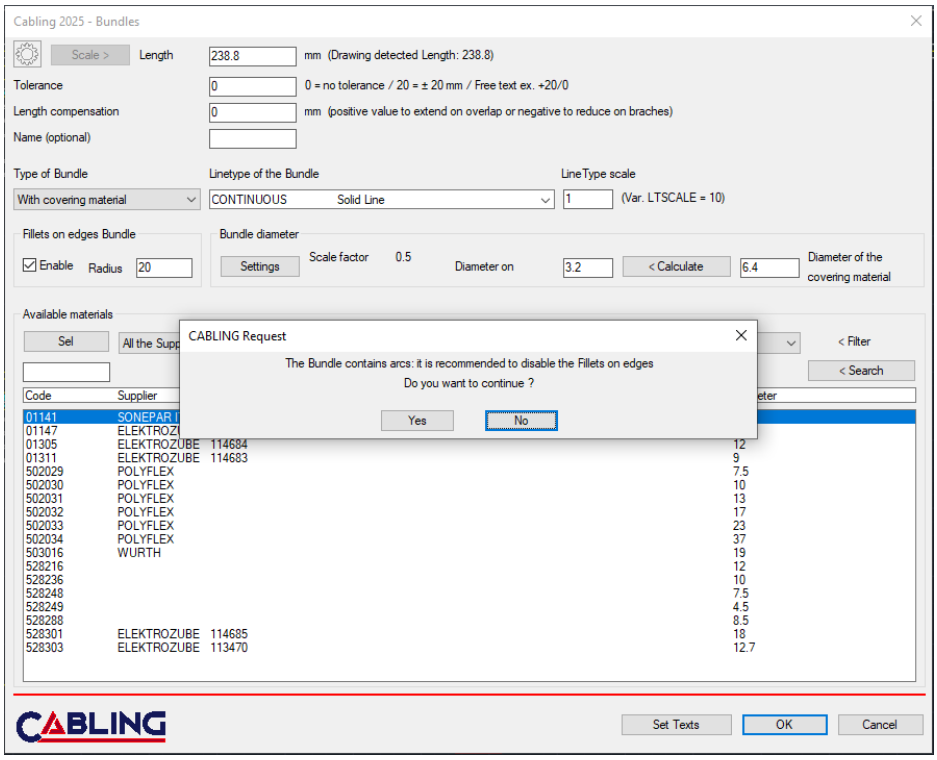




In the radial Bundles drawing the position of the texts has been moved towards the free end thus avoiding overlapping of the texts with the other Bundles.

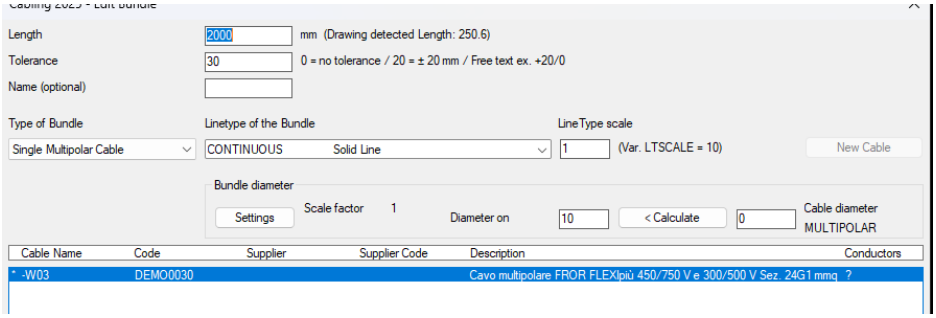


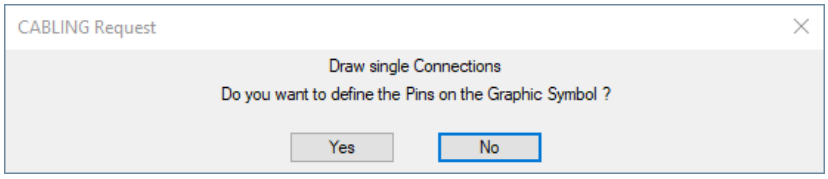
Finally, if you draw Bundles with material containing arcs, you are prompted to disable the checkbox 'Enable Connections on Bundles edges'. This is because in some particular situations the connection is so small that the command that creates the graphics of the Bundles with materials may not work correctly.



2.23 MODIFY BUNDLES DIAMETER

After changing the diameter of a Bundle with covering material CABLING asks if you want to scale all those with the same code, if founded in the currente sheet.



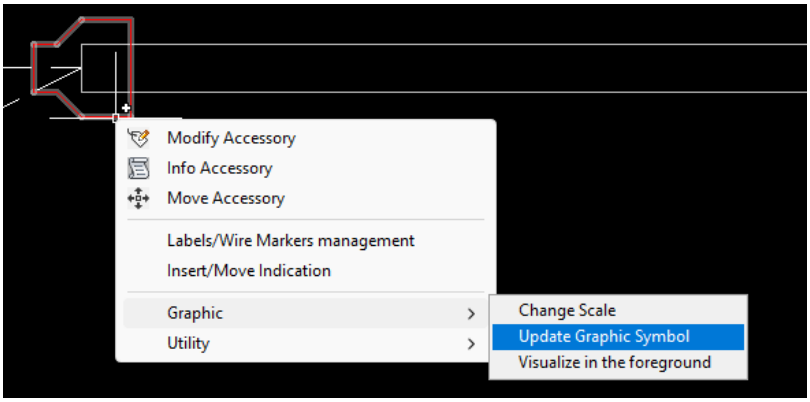


These small changes are often requested by users that we insert into the program to improve it. These are changes that:

- *make work easier and faster*
- *do not complicate the program because the questions to the user only occur if the conditions are met*
- *often the questions are accompanied by the checkbox 'Do not ask the again' for the current drawing session.*

2.24 UPDATE ACCESSORIES GRAPHICS

The graphic symbol of an accessory can also be updated by using the graphics of the block saved in the user graphic symbol library (Cabling_Blk).



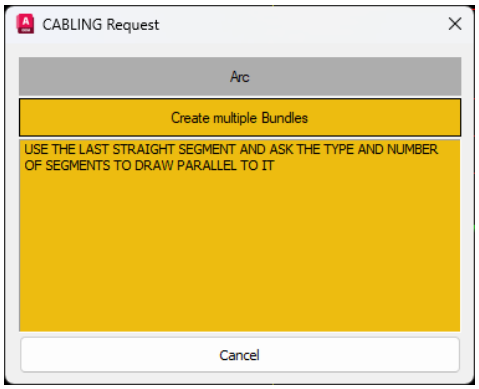
2.25 ADDITIONAL CHECK IN HARNESS CHECK 

With the ‘Check harness’ command, but also at each start of the ‘Connections’ command, Cabling performs a check to ensure that any terminals of a connector are not of more different types: male and female.
This can happen on connectors that can accommodate both male and female terminals, such as faston connectors.

These additional checks are also requests that often come from users and are used to check that the design work has been carried out correctly.

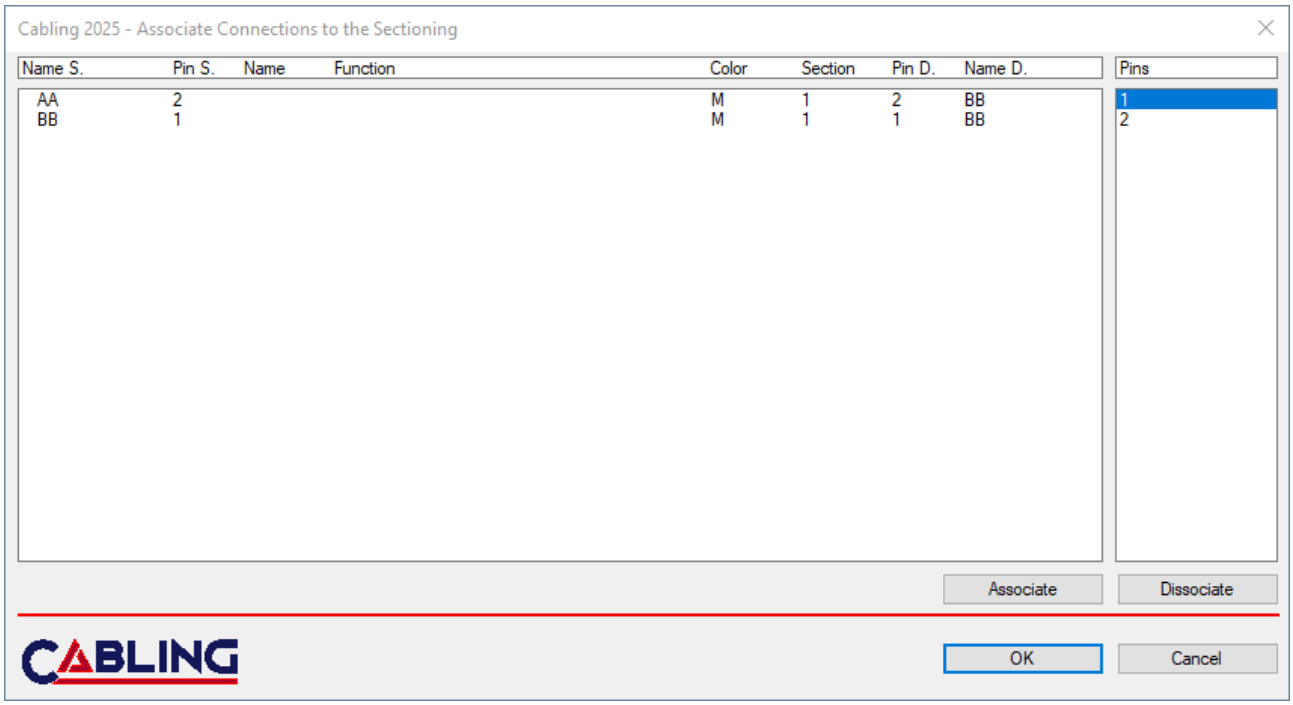
2.26 CREATE MULTIPLE BUNDLES ON FIRST ENTER

The ability to create multiple Bundles is now also given if you press enter after defining the starting point of a Bundle. The previous mode that allowed you to create multiple Bundles after drawing the first segment is maintained. The new possibility was inserted mainly as a 'logic' improvement in the use of CABLING.



2.27 SECTIONING MANAGEMENT

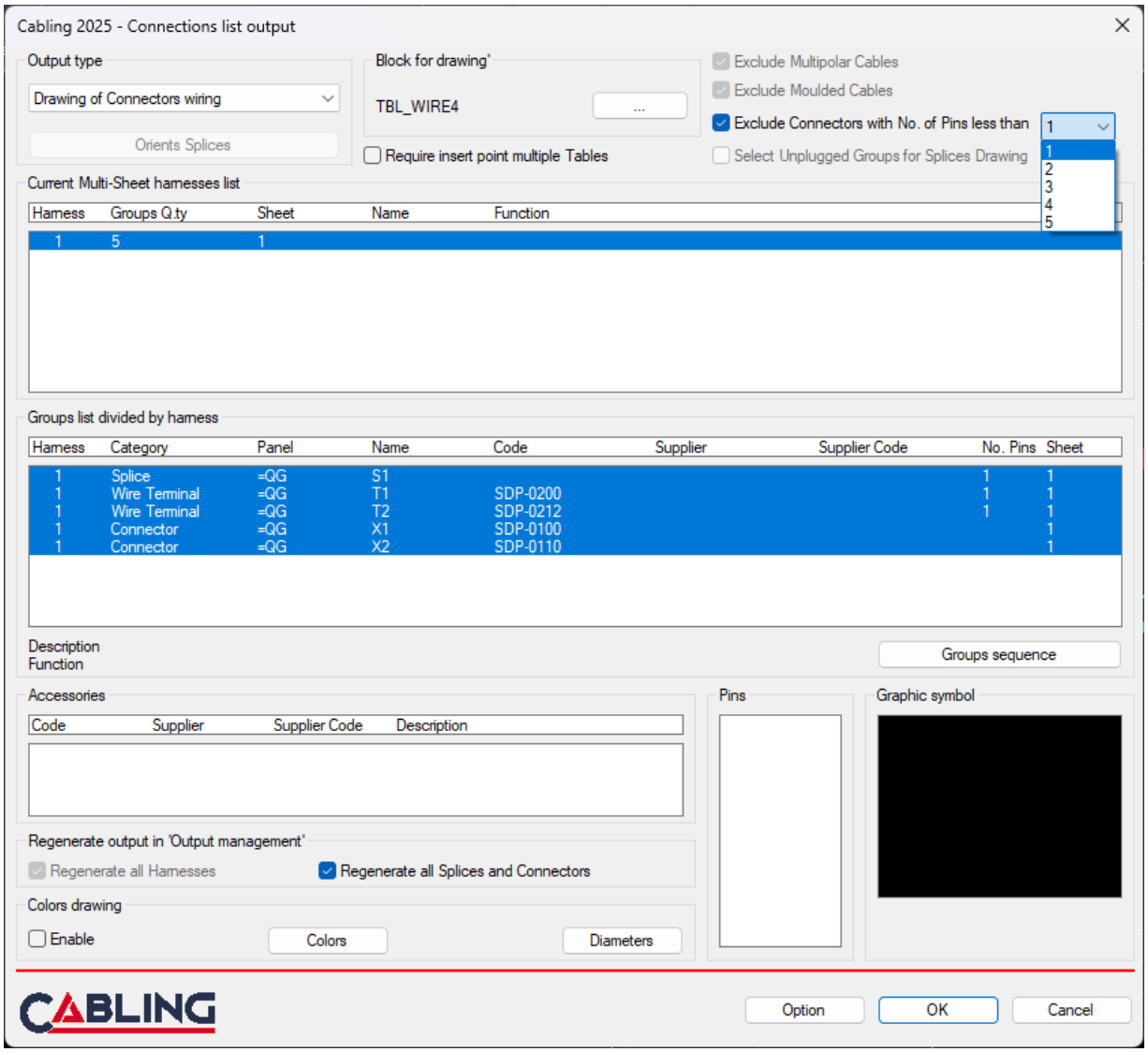
Improved sectioning with the ability to assign connections to the sectioning pins.



This way you can directly decide how to associate the connections to the pins of the connectors inserted to section the selected Bundles.

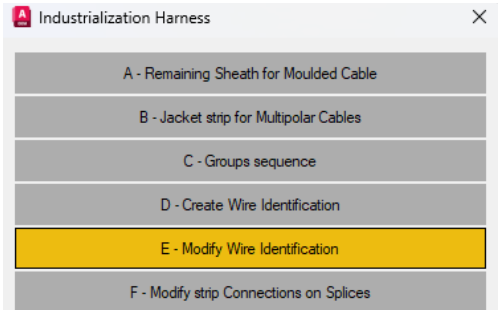
2.28 OUTPUT CONNECTIONS OF CONNECTORS

Many users define the faston cover as a one-way connector. No problem for CABLING, but in the output 'List of Connections → Drawing of Connectors Wiring they appear. For those who do not want to see connectors with a number of pins equal to 1 (but also up to 5) in this type of output, the checkbox 'Exclude Connectors with a number of Pins less than' has been inserted



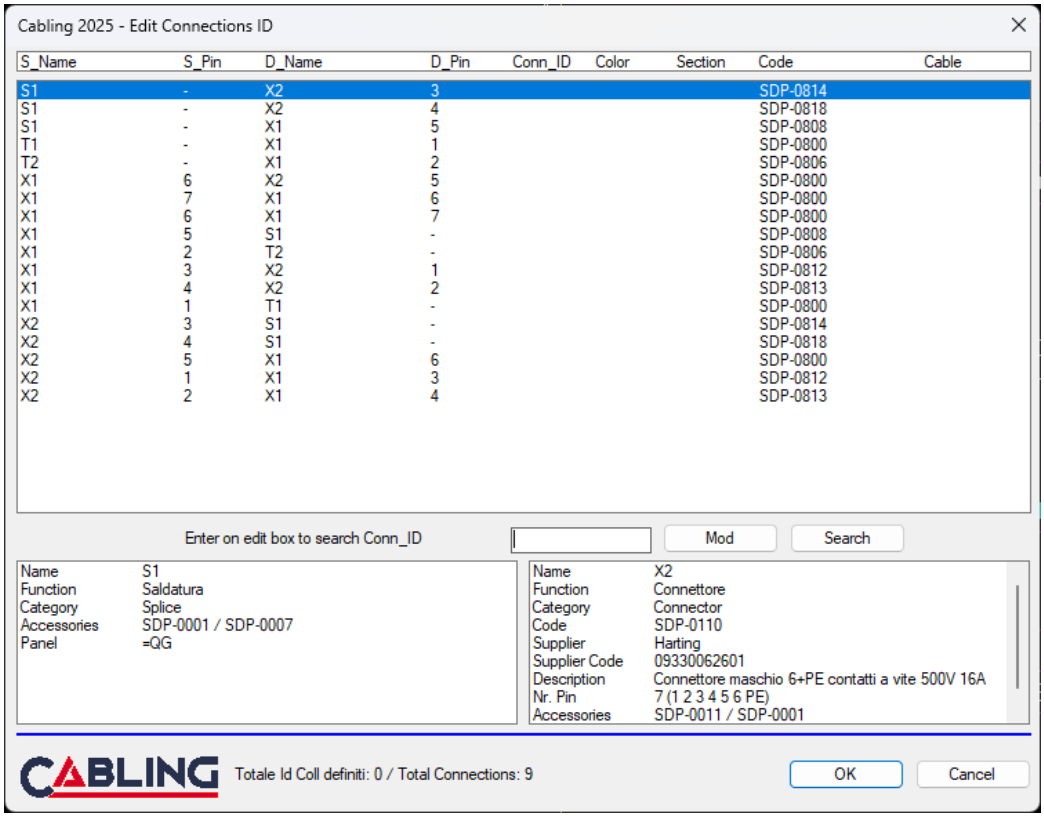
2.29 EDIT CONNECTION IDS

Cabling has long had an additional information regarding the Connections of the Harness layout: ID Coll or Wire ID.
This value is not found in the standard connection management windows but in the Harness Industrialization commands.
It is a value that is managed to uniquely identify a connection when it becomes necessary, for example, to find this identifier in the production context. If you manage this identifier, it could be easier to find cut wires, tied with adhesive tape with this number.



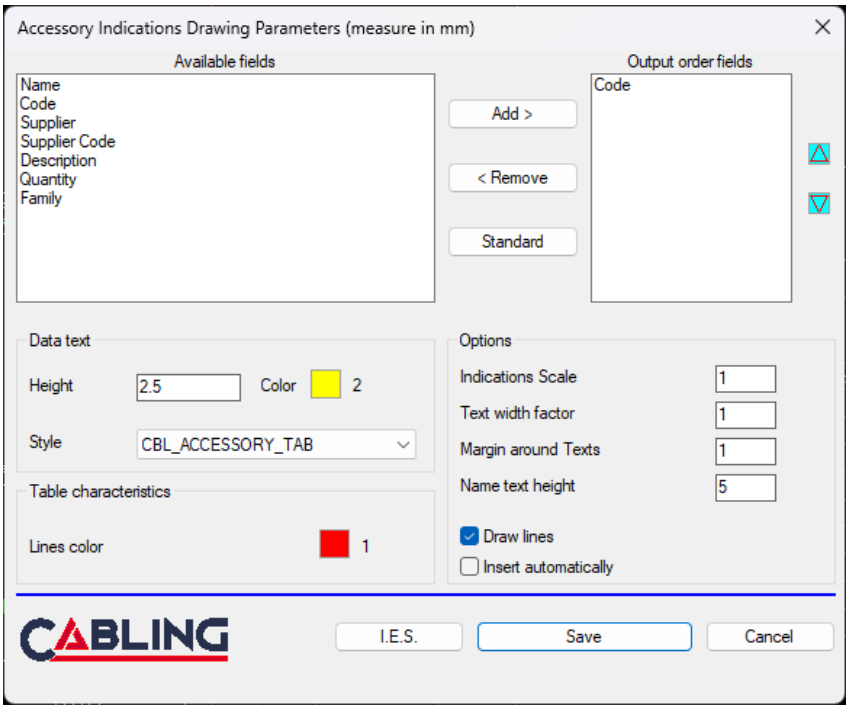
The command has been revised with the window that manages:

- sorting of groups
- repetition of start groups (S_Name) to facilitate editing based on the group
- reporting of the Coll IDs already defined with respect to the total connections
- display of the start and end group information



2.30 FIELD 'TYPE' ON ACCESSORIES INDICATIONS

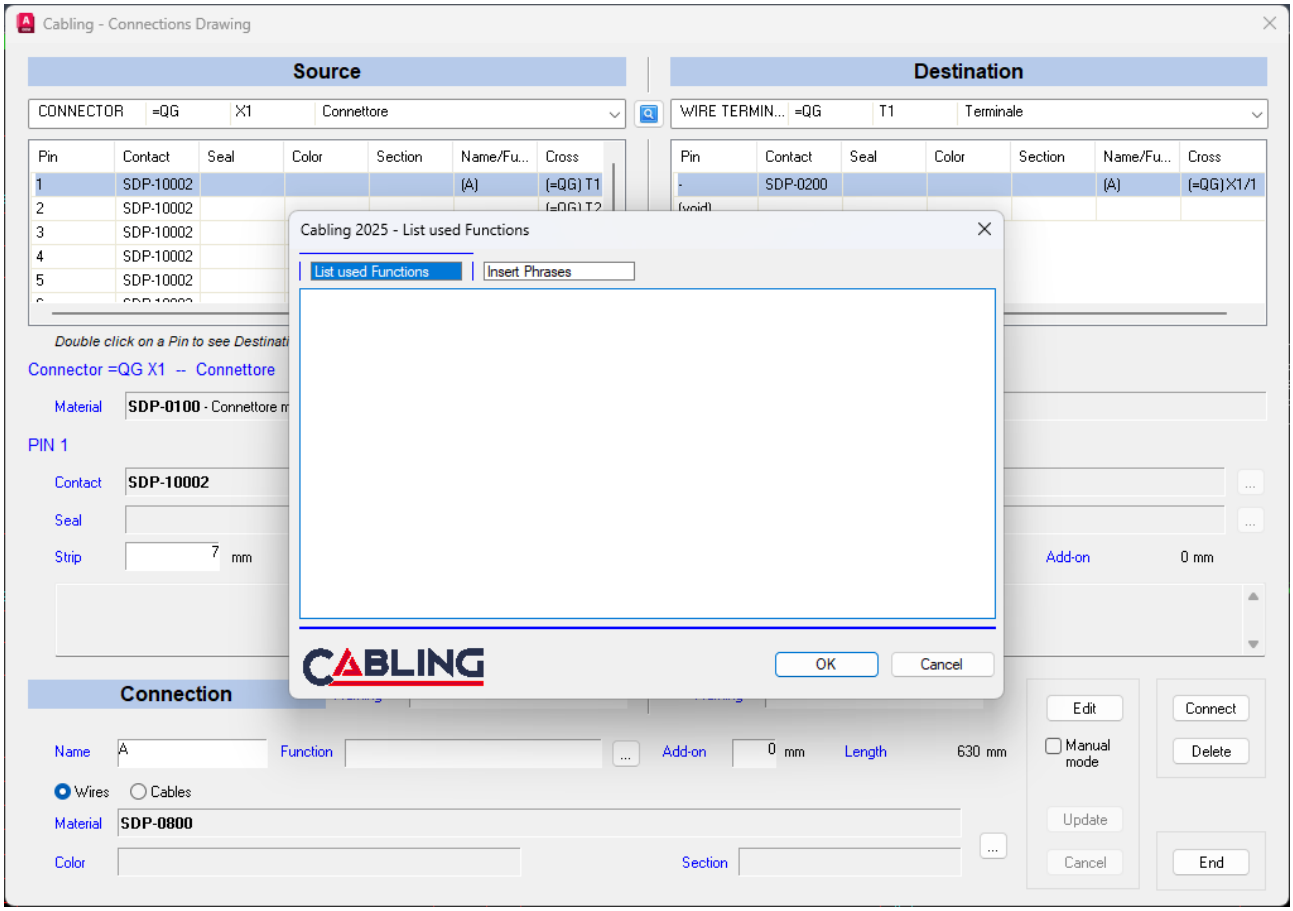
Upon request, the Family (or Type) field has been added, which reports the one eventually defined in the materials database. For example, on layouts created by design companies, being able to generically insert the Accessory Family (or Type) simplifies the reading by those who produce the harnesses, who will choose the appropriate material (Strap, Cable Gland, Label, etc.)



2.31 FUNCTION OF CONNECTIONS

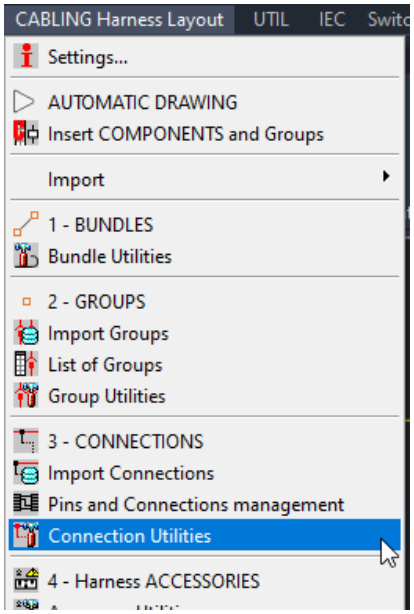
By pressing the '...' button next to the function, the 'List of used functions' dialog box opens, which now has two tabs:

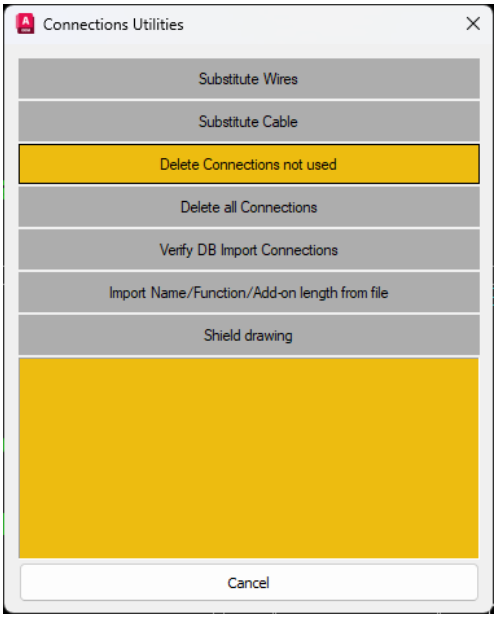
- Insert Phrases to choose a phrase from the phrase database (already existing tab)
- List of used functions to choose one of the phrases already used in the current drawing (new tab)



2.32 REMOVE UNUSED CONNECTIONS

During the design it can happen, even if rarely, that some connections remain hanging only from one end or from both.

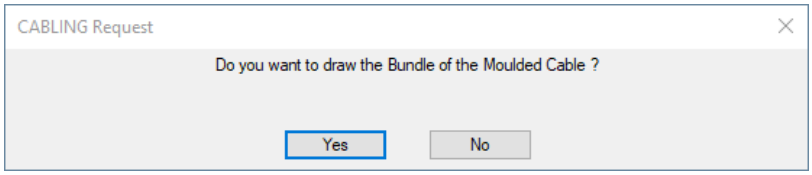




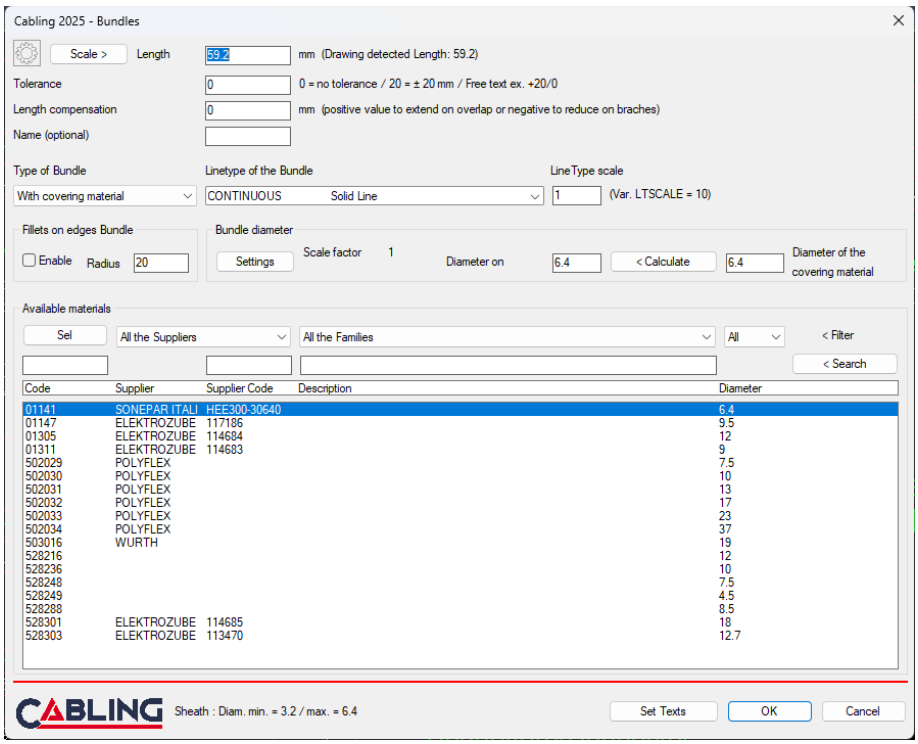
With this command these connections are deleted but now the indications of the Groups are also updated, avoiding the user having to do it.

2.33 INSERT MOULDED CABLES

Always to simplifying and speeding up the work of designers, after choosing to insert a Moulded Cable group, the following question is asked:

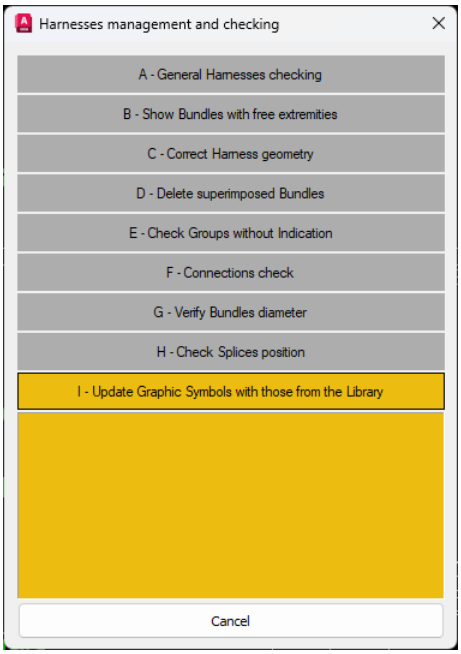


If you answer Yes, CABLING will allow you to draw the Bundle of the cable and opens the window for defining the Bundle directly with the type 'Single Multipolar/Moulded Cable' where you can enter the its length.



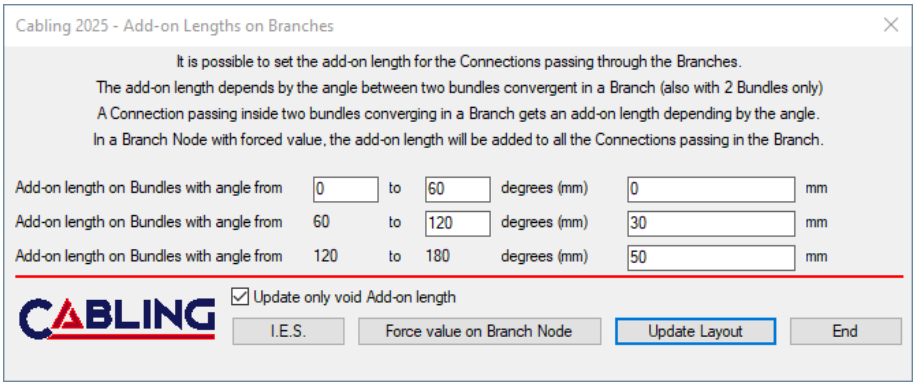
2.34 UPDATE GRAPHIC SYMBOLS

Among the possible checks that can be performed with the 'Harness Management and Checking' command, there is now the option 'I – Update Graphic Symbols with those from the Library' that updates the graphic symbols present in a harness layout, maintaining the scale and rotation of each individual symbol.
This allows you to easily update the graphic symbols on old drawings if changes have been made to the symbols stored in the Cabling_Blk folder or in one of its sub-folders.



2.35 CALCULATE ADD-ON LENGTH OF CONNECTIONS

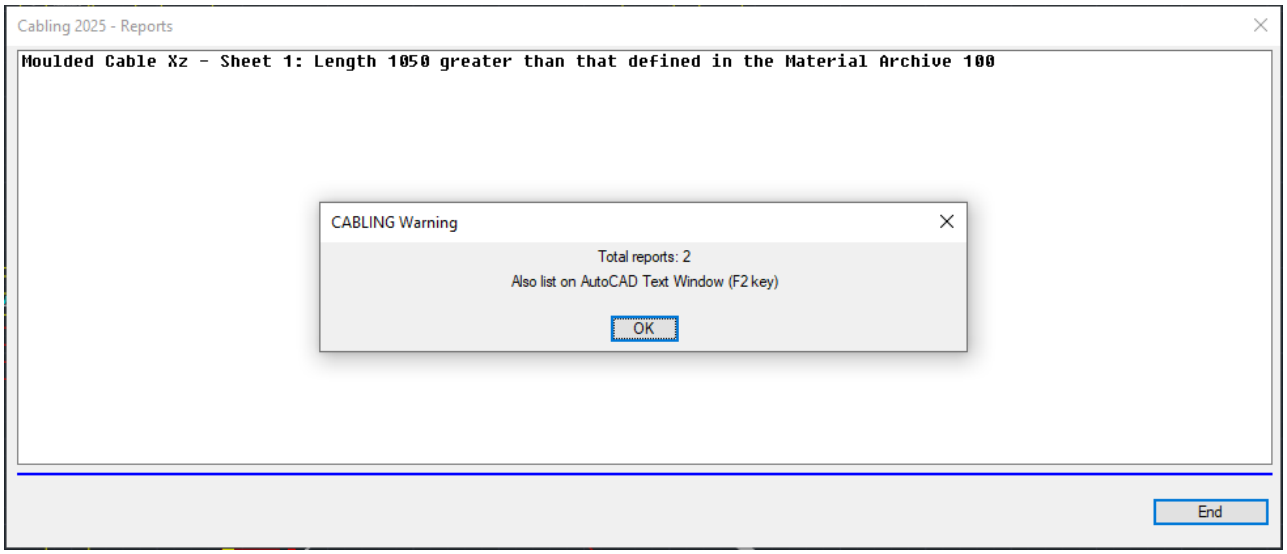
In this command, the 'Update only void Add-on lenght' checkbox has been added which allows you to update only Connections that have a Add-on length of zero.



2.36 HARNESSES CHECKING

New checks have been added to this command, including:

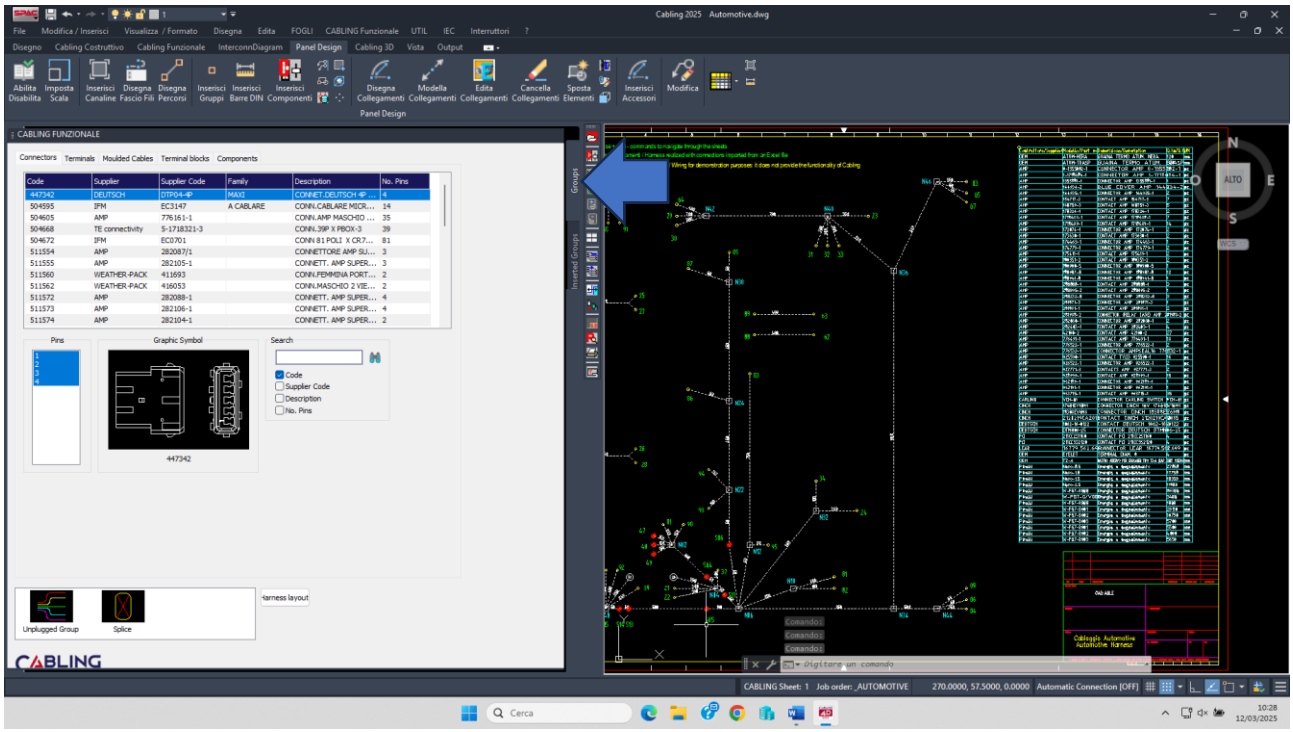
- Check that the maximum lengths of moulded cables defined in the material database are respected in the current drawing. Otherwise, a warning is given as in the image below
- Especially in the automotive sector, there are connectors that can accommodate male or female terminals (for example, fastons). Now a warning is given if a connector has terminals of both genders, which is not normally correct: Connector X1 – Sheet 1: Terminals of different 'Gender' found.



3 WIRING DIAGRAM

3.1 INSERT GROUPS AND COMPONENTS

CABLING 2025 has a new way to insert Groups into the wiring diagram through the new window below:



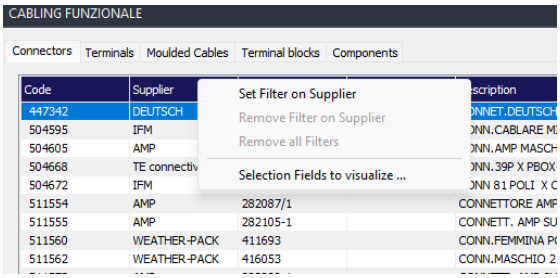
The window has the following features:

- It is resizable.
- It can be anchored to the left or right side of the drawing area.
- It can be minimized without being closed.
- It has two side tabs for two different modes: Groups and Inserted Groups.

In the Groups mode, the window displays a series of tabs at the top corresponding to the available material categories: Connectors, Wire Terminals, Moulded Cables, Terminals and Components.

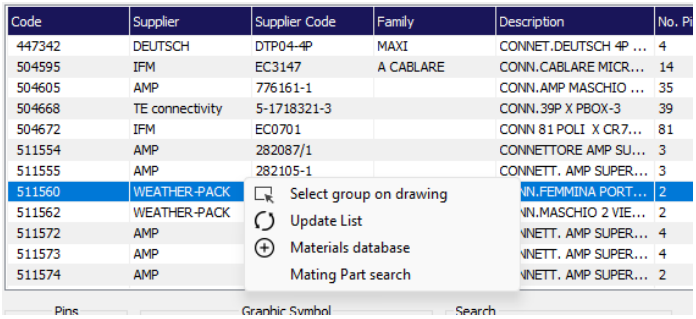
At the bottom of the window, two images are available for inserting Unplugged Groups and Splices.
Below the materials list, there are other areas that depend on the material category: for example, for a Connector, the list of Pins, the image, and for all categories, an area dedicated to searching for the desired material using keywords.

It is also possible to set Filters by right-clicking on the material list titles.



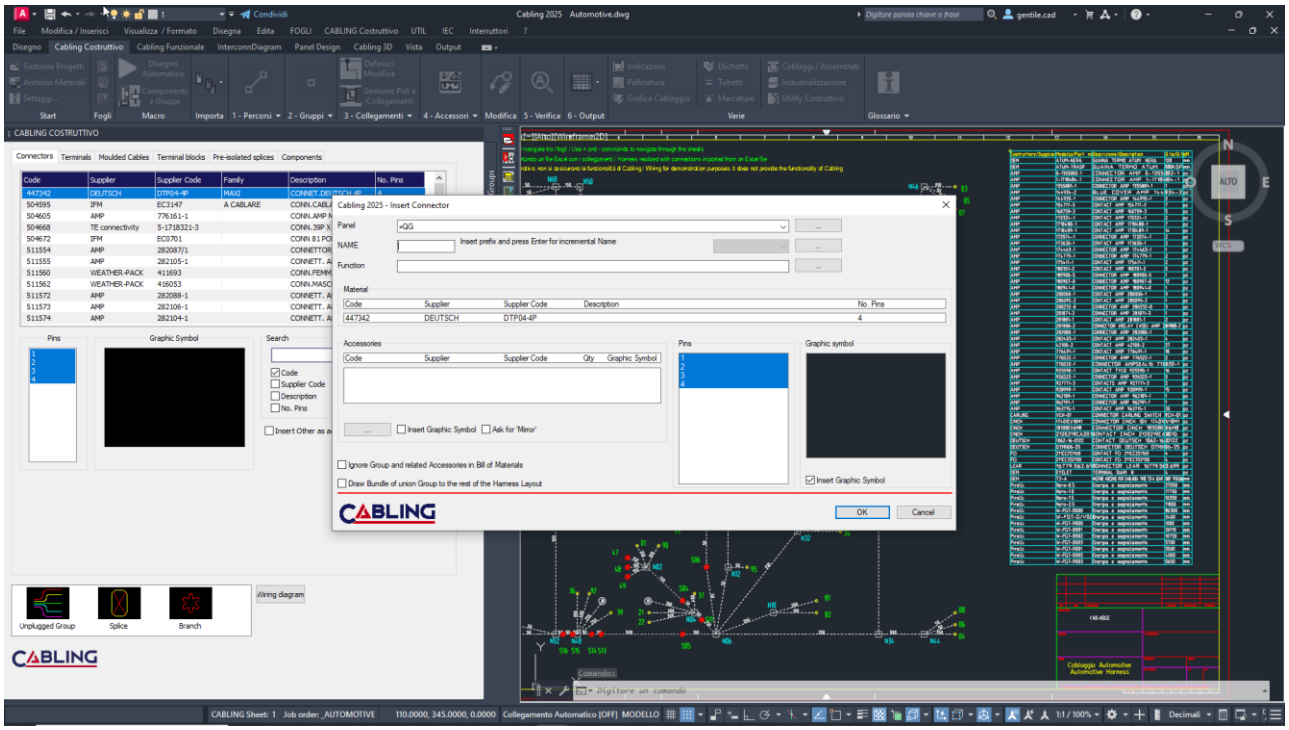
Right-clicking on the material list will open a context menu where you can:

- Select a material to place on the drawing.
- Update the material list if there have been any changes in the materials archive.
- Open the materials archive.
- For connectors and terminals, search for the mating part.



Additionally, two extra buttons:

- Harness Layout: to switch to the same window adapted for the this environment.
- Help (only for Components): To open a help file on how it works.

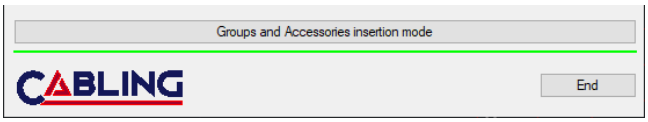


Inserting materials: Choose a material from the upper material list and insert it by dragging and dropping it with the mouse into the drawing area. You will then be prompted for additional

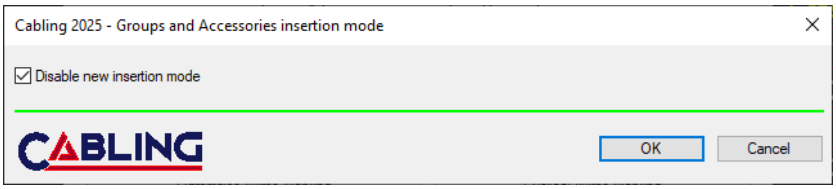
information (e.g., name, function...) and asked for the insertion point on the drawing, as in previous versions. The same applies to the images for Unplugged Groups and Splices.

If you do not wish to use this new mode of operation, you can revert to the previous mode as follows:

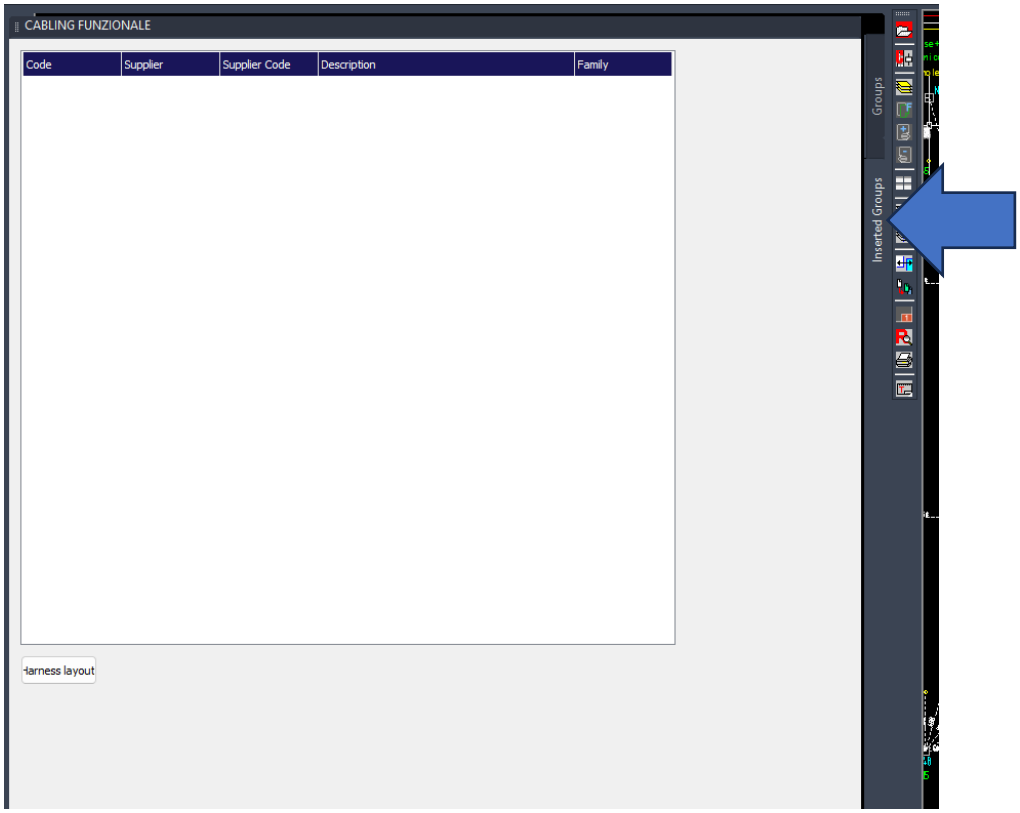
- Go to the Harness Layout environment settings.
- Use the button below.



Check the box for 'Disable new insertion Mode'.



In 'Inserted Groups' mode, the following window appears, listing the materials inserted into the current diagram. In this window, you can also select a material and drag it into the drawing area to insert it.



3.2 NEWS ABOUT COMPONENTS WITH CODE

A component is made up of one or more graphic symbols with entry points called Pins, possibly divided into Ports.
If the component is made up of multiple graphic symbols, the first is considered the 'mother' component, the subsequent 'children'.
The choice of having a single graphic symbol or multiple symbols depends on the user's needs. Example: a coil can have its contacts in the same symbol or have the coil separated from its contacts. Another example: a symbol of an electronic board that cannot fit into a single drawing sheet can be separated into multiple symbols.

There are three types of ports:

- Ports with mating part
- Ports with multiple pins
- Sequence of single pins

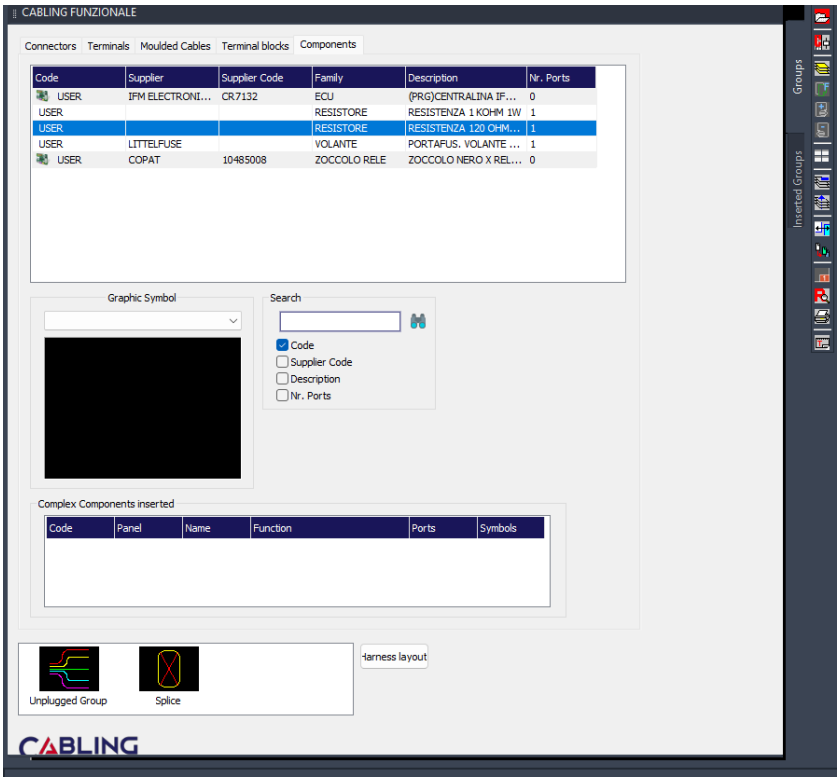
For each component to be inserted, the Panel, a unique Name (which cannot be repeated) and an optional function are required.
For components with multiple ports or with only one port with mating part, a name and a function (optional) will be required for each port.
In the case of simple components, the name of the component will correspond to the name of the single port without mating part.

Ports with mating part (for example a connector) require the insertion of _MORS* symbols that correspond to the pins of the mating part. Ports without mating part instead require the insertion of reference points on the single graphic symbol or on the graphic symbols of the component.
The peculiarity of CABLING is that it is not necessary to store the graphic symbols with reference points: they are defined directly during the first insertion and then saved in the materials archive for subsequent uses.

In previous versions of CABLING it was necessary to insert the _MORS symbols also for ports without mating part.*

Select the upper tab 'Components', choose a material of a component from the upper list and insert by dragging it into the drawing area with a drag & drop: the symbols of the component will be inserted first and then the ports will be inserted.

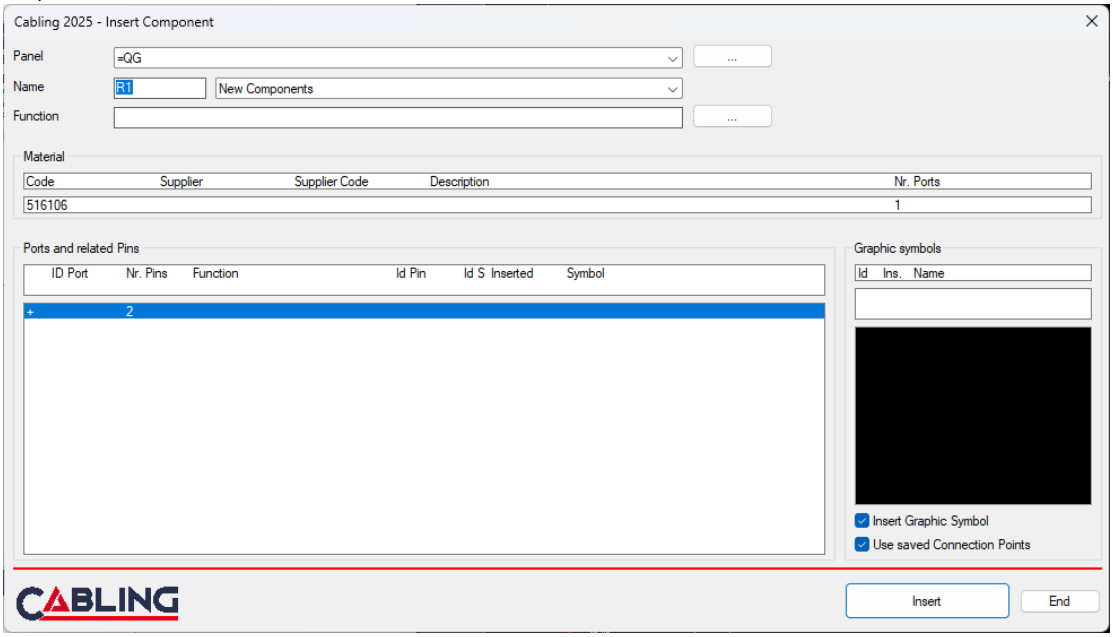
With the exception of simple components, all the others will be inserted in the list of components inserted in the lower part of this window.
The reason for this list is to monitor the list of ports and graphic symbols inserted in the diagram (Ports and Symbols columns) where if you find green dots it means that the component has been completely inserted. If it is not, you can drag the selected component from this list into the drawing area to complete the insertion.
For example, if you want to insert a coil with a separate contact (2 graphic symbols), you can first insert the coil as a new material and then (in another sheet of the diagram) the contact, select from the lower list and drag into the drawing area to insert the child contact.



To sum up:

Simple single port component without mating parts	Insertion of one or more graphic symbols with reference points defined on the blocks without requiring further name because the name is that of the component.
Component with mating parts or with multiple ports	Insertion of one or more graphic symbols with reference points defined on the blocks for Ports without mating parts and with insertion of _MORS* symbols for Ports with mating part.

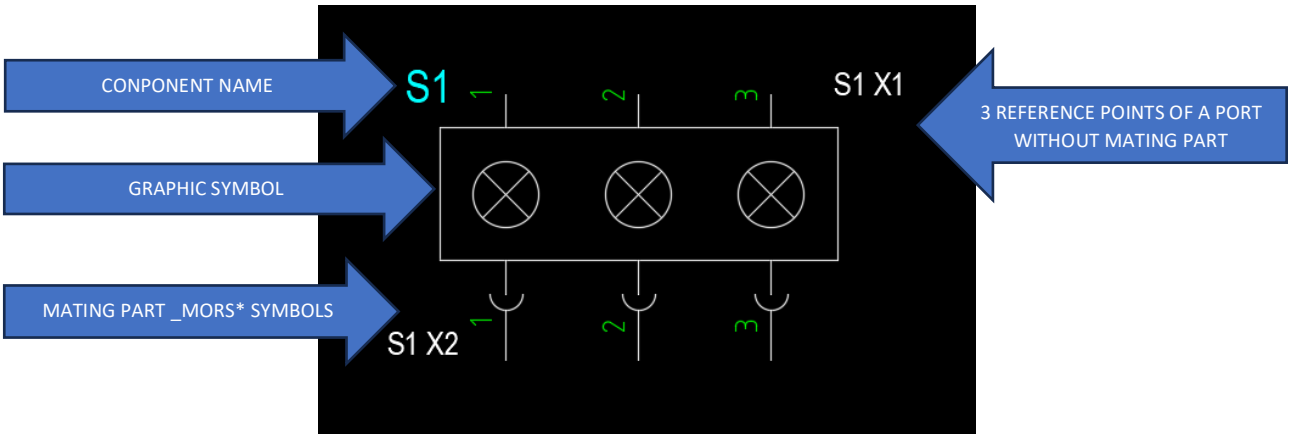
The window that opens after dragging into the drawing area is the one below, where you can indicate the Panel, Name and function, see the material data, the Ports and the graphic symbols that compose it.



There is another way to insert components: define the components but do not insert them into the electrical diagram, inserting only the mating parts. This mode can be used to create simplified wiring diagrams dedicated mainly to the interconnection of the harness.
The component (even if not inserted) is saved in the drawing and considered a 'usage' with a specific code and function.
To enable this operation, simply remove the 'Insert Graphic Symbols' flag from the previous window.
For Ports with a mating part, the _MORS symbols will continue to be inserted and the same will happen for the other Ports, not being able to use the referecne points of the graphic symbols.*

The Names of the Ports of a component are proposed in this way:
Component Name + ID of the port defined in the material database separated by a space.
The one eventually defined in the material archive is proposed as the Function.
Obviously you can change the Name and the Function as you like, with the exception of the Panel which will remain the one defined in the component.

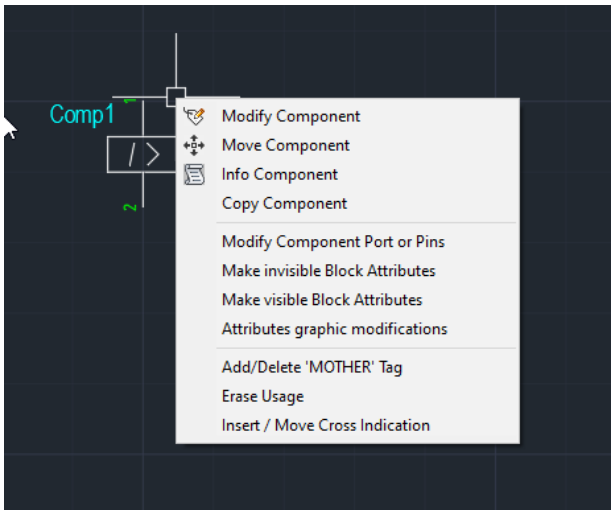
Here is an image of a component with only one graphic symbol, a port with mating part (X2) and a port without mating part (X1):



3.3 EDIT COMPONENTS

Modification of a component can be done with the following rules:

1. selecting the graphic symbol of a component and using the 'Modify Component' option in the context menu to change the Panel, name and function, not the material.
2. selecting a pin of a mating part of a component to modify its characteristics
3. selecting the graphic symbol of a component and using the 'Modify Port or Component Pins' option in the context menu to modify the name and function of one of the ports without a mating part inserted in the symbol with the relative reference points.



A symbol of a component can also be moved by selecting it and using the 'Move Component' option in the context menu: the _MORS* symbols of the counterparts will also be moved, together with any connections.

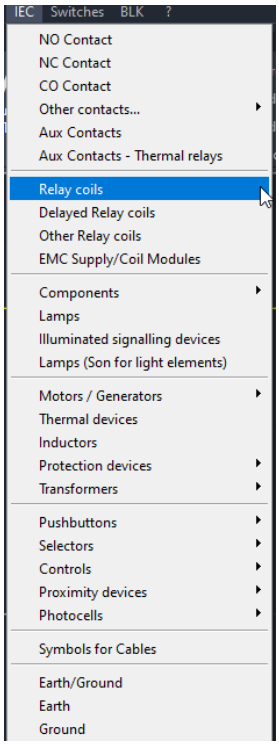
Finally, a component can be copied by selecting it and using the 'Copy Component' option: the component name will be requested and the new symbol with the relative ports will be inserted.

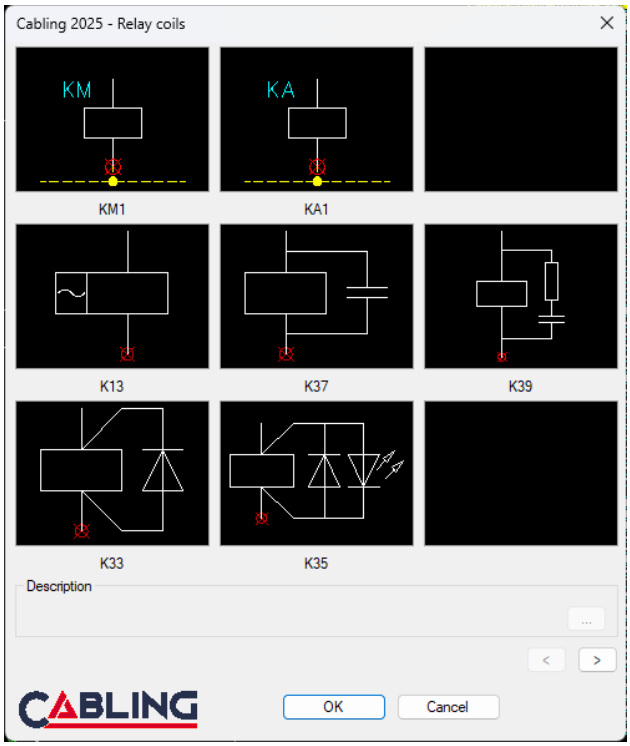
3.4 NEWS ABOUT COMPONENTS WITHOUT CODE

A component can be inserted into the diagram even without material, as a generic component. Components can be normative (IEC, JIC...) or user BLKs created by the user.

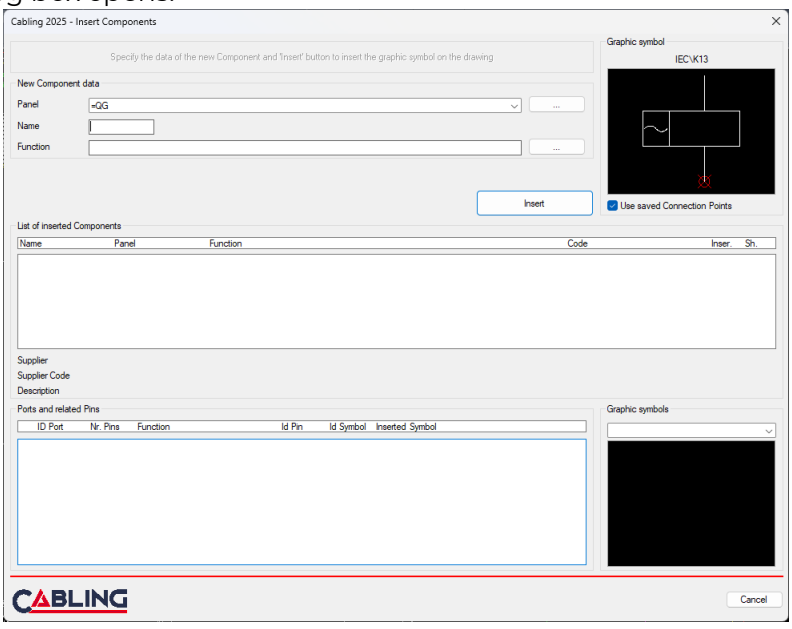
It is also possible to perform mixed insertions of coded and non-coded components.
To insert a generic component:

1. from the menu by choosing one of the types and one of the symbols that are presented in the dialog box



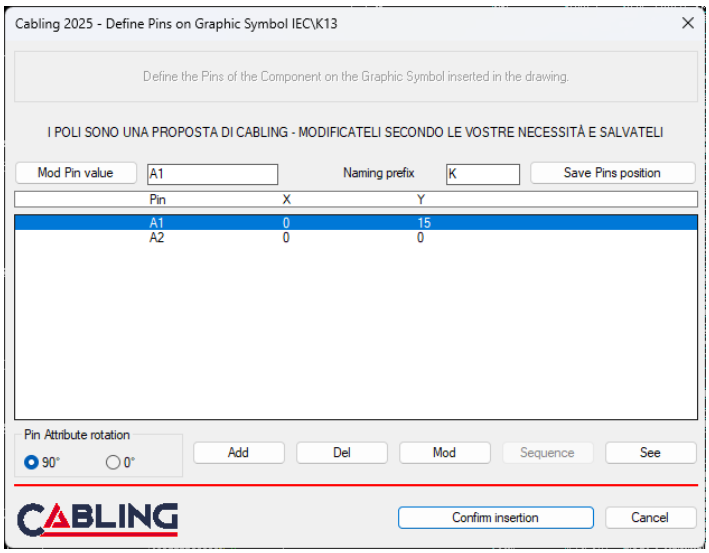


The following dialog box opens:



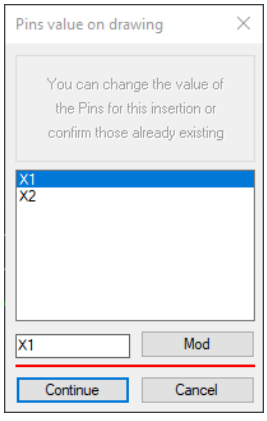
where you have to insert the component code and its function, if any. In the lower part of the window you will find the components already inserted previously.
By pressing the 'Insert' button, you are asked for the insertion point of the component symbol and subsequently you can have two options:

- If it is the first time that the component is inserted, a dialogue box opens where you can insert and possibly save the reference points of the symbol, those where the electrical connections will arrive.



This window opens even if the checkbox 'Use saved connection points' is disabled from the main window.

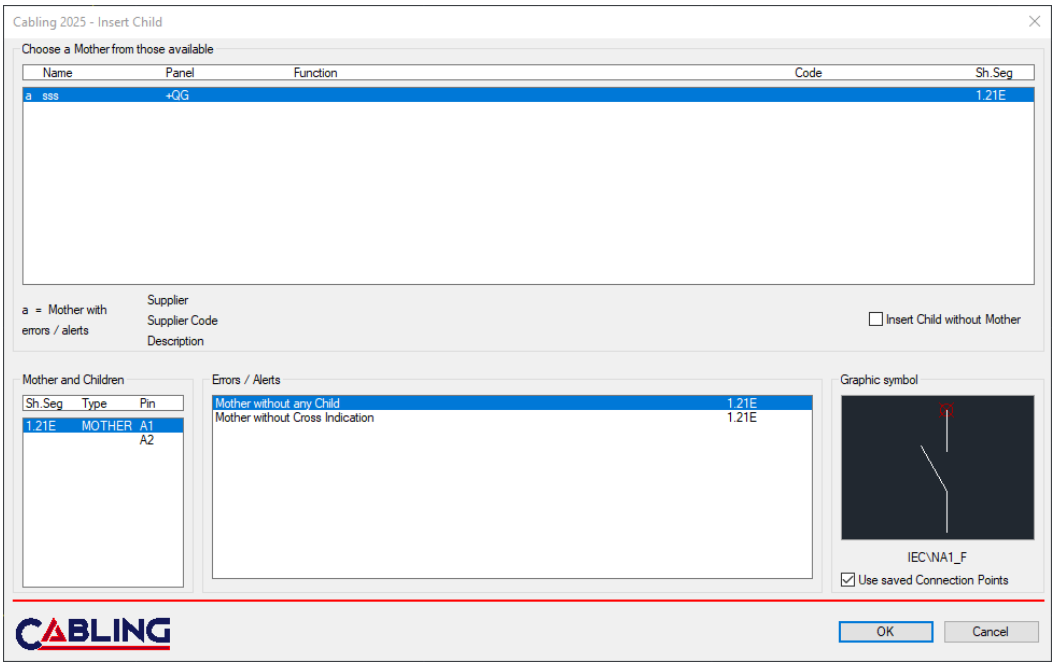
- In subsequent insertions (if the 'Use saved connection points' box is active) the window below opens where you can change the values of the Pins on the graphic symbol (without changing their position).



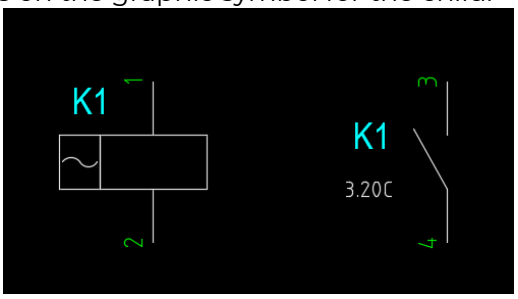
Symbols inserted in the IEC, JIC, VDE or Electronics libraries are already divided by symbol type:

- Mother Symbol (for example a coil)
- Child Symbol (for example a coil contact)
- Neutral symbols (for example a lamp).

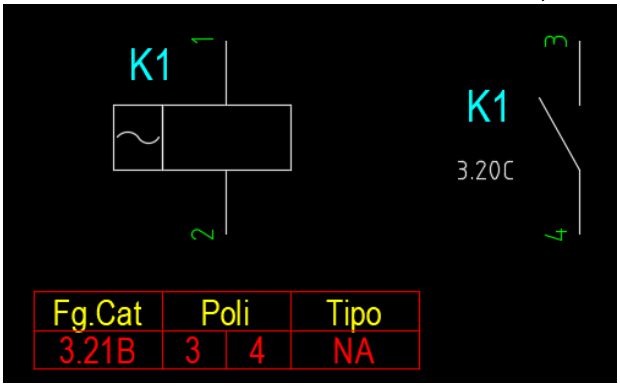
So when inserting a coil with a contact, first insert the coil and then, if you insert a contact, the following window opens:



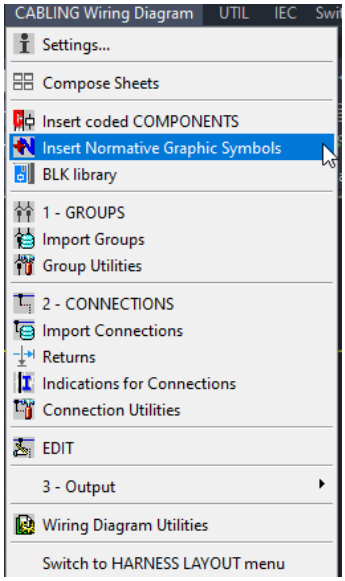
In this window you can choose the coil (mother) to which to 'hook' the contact (child) before inserting it into the electrical diagram: mother and child will have the same code. You can also change the values of the Pins on the graphic symbol for the child.

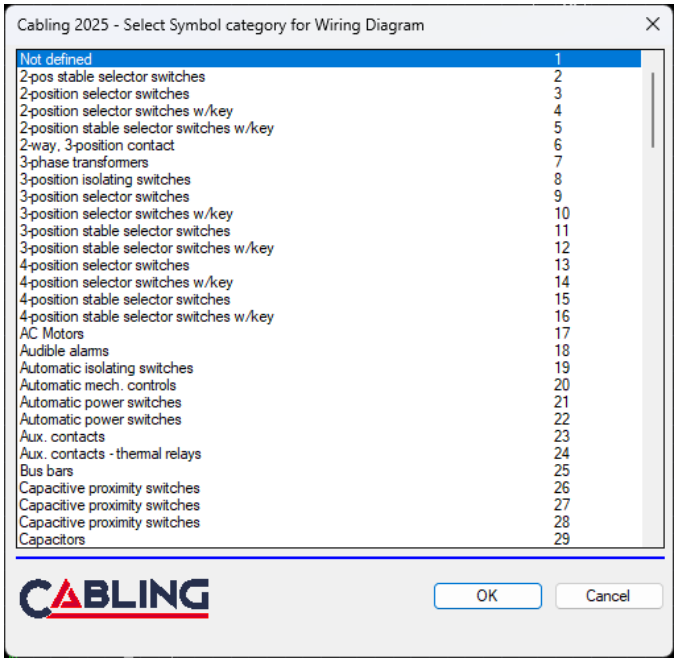


In the window there is a check of the situation of the individual mothers: for example, before inserting the child, it is reported that the mother has no Child on the diagram.
The position of the Mother in the diagram is automatically inserted: sheet (3), separator (.) and catenary (20C).
It is also possible to insert a Cross Indication near the Mother, a topic we will discuss later.

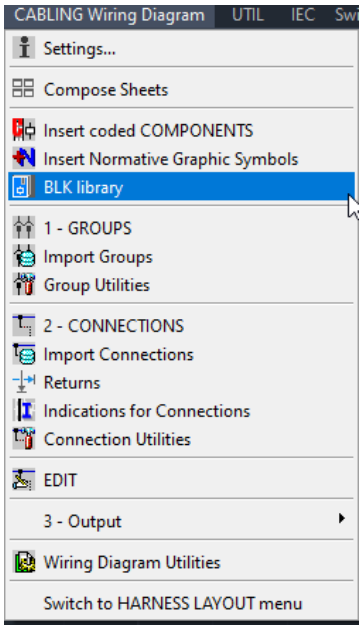


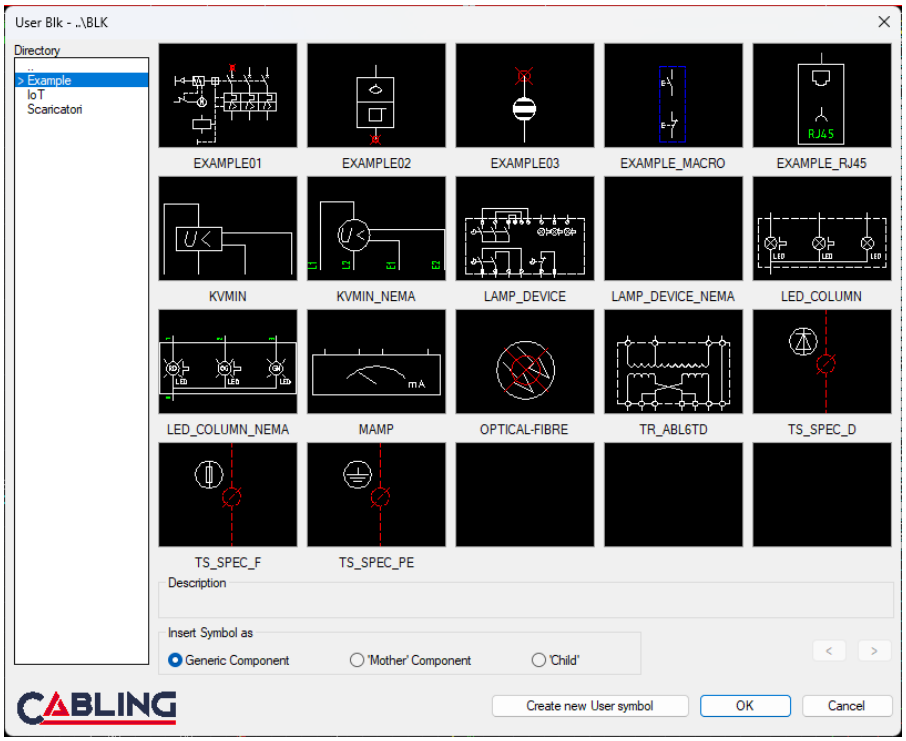
To insert a normative symbol, in addition to the dedicated IEC, JIC, VDE or Electronics menu, it is possible to recall it from CABLING Wiring Diagram → Normative Symbol Library which calls up the following window from which to choose the category of symbol to insert.





To insert a component with a custom graphic symbol created by the user, you must use CABLING Wiring Diagram → BLK User Symbol Library which opens the following window:





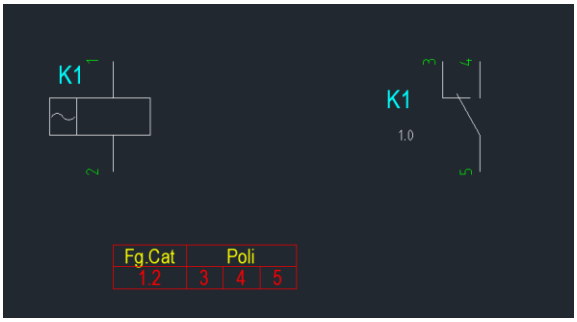
You can choose one of the symbols available in the BLK folder or in one of the sub-folders. The chosen symbol can be inserted as a 'Generic Component', such as 'Mother' or 'Child'.
A button has also been added to create a new User symbol.

3.5 MANAGEMENT OF MOTHER & SONS COMPONENTS

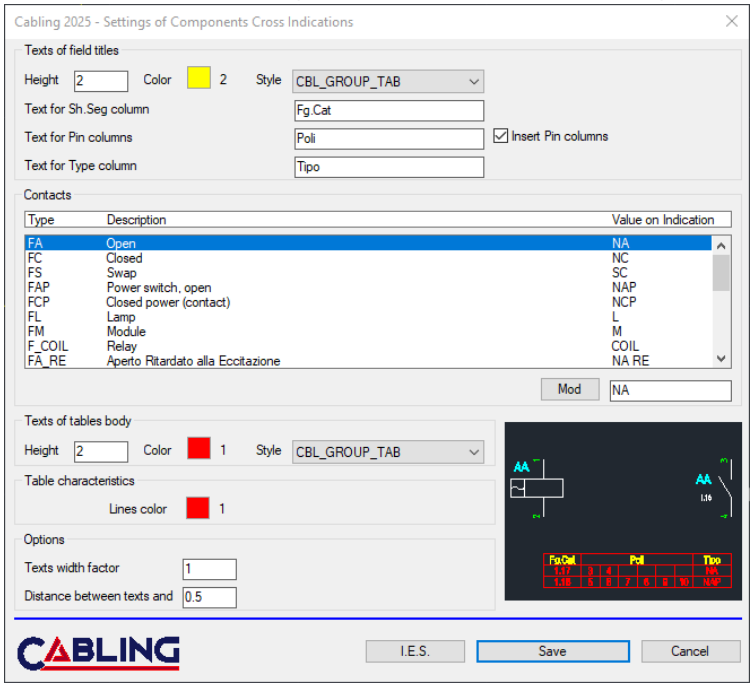
In CABLING 2025, more types of components have been provided:

- Terminals/Terminal Blocks
- Connectors
- Terminals and soldering
- Unplugged Groups
- Generic components
- Mother and Children components

Mother and Children Components have been provided to allow a component to be divided into multiple graphic symbols. For example, a coil (mother) with one or more contacts (children) or an electronic board divided into multiple parts. Mother and children are considered as a single component and are identified with the same Name and belonging panel. The mother contains a PRES attribute with M, the children an attribute PRES that begins with F.



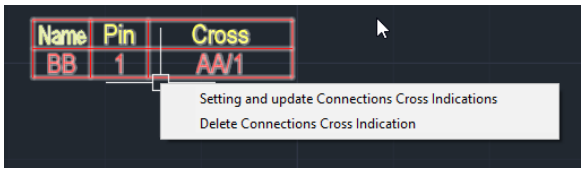
To allow you to understand where the mother and children are in the diagram, two modes have been provided, one linked to the mother and the other to the children. The mother can have a Cross Indication associated with it that reports the Sheet.Segment position of the children and their value of the Pins. For the children, the REG attribute is filled in that indicates the Sheet.Segment position of the mother.
The Cross Indications provide a window with the parameter settings:



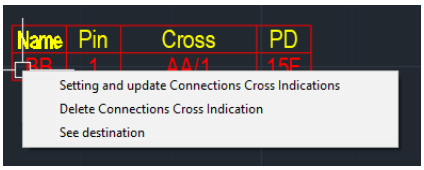
There are three columns, one for the Sheet.Segment of children, the other for the values of the Pins, the last for the Type column. The Pins column is further divided for the individual values up to a maximum of 8. If a child has more than 8 poles, the Pins column is automatically omitted.

The Type column provides one of the values from the 'Contacts' list.

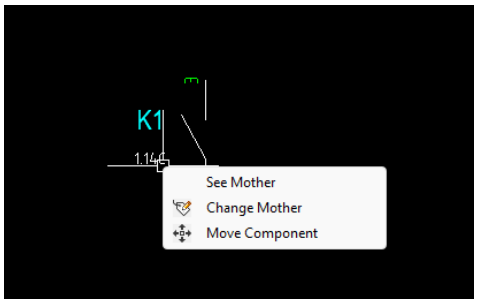
To display the window, you need to right-click on a previously inserted Cross Indication.



If you instead right-click on one of the texts, a contextual menu will be displayed to see the destination, that is, the child to which the selected text belongs.



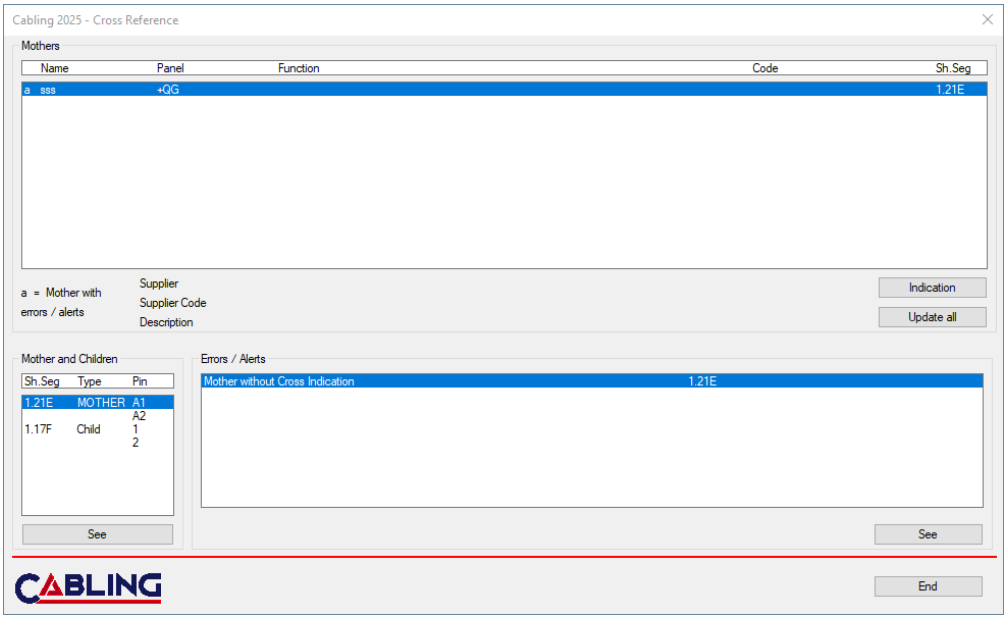
By right-clicking on one of the Children, a context menu will be presented to view or change the Mother.



3.6 CROSS REFERENCE

The Cross-Reference command directly opens the window below in which the mothers found in the current multisheet are listed. The list shows the name, the panel, the function, the possible material code and the position of the Sheet.Segment of the individual mothers. If a mother has errors or warnings, the letter 'a' is displayed on the corresponding line and in the 'Errors / Reports' section they are listed. It is possible to see the symbols that have a problem with the 'See' button.

With the 'Indications' button you can insert the indication of the selected mother or move it if it is already present. With the 'Update all' button all the mothers and children are updated, that is, the existing indications are updated and the Sheet.Segment of the corresponding mother is inserted in the children.

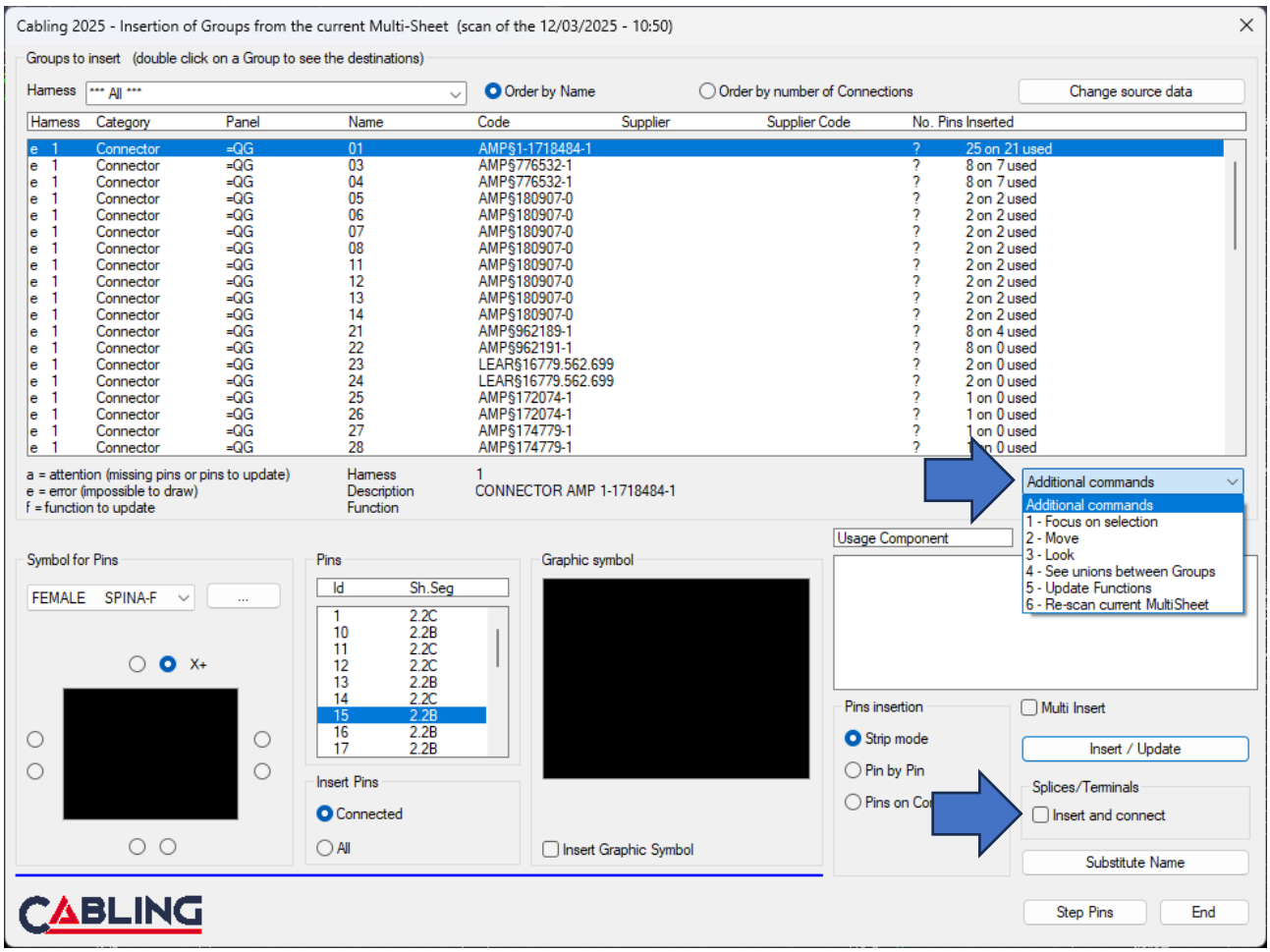


By selecting individual mothers, the Sheet.Segment information, the typology (mother or children) and the pins used are displayed in the 'Mother and Children' section. The error/warning messages are:

- More than one Mother with the same name found
- Mother without any Child
- Mother with the same name as a generic Component
- Attribute not valued
- Repeated pole
- Mother without Cross Indication
- Child/son without Mother
- Child with the same name as a generic Element

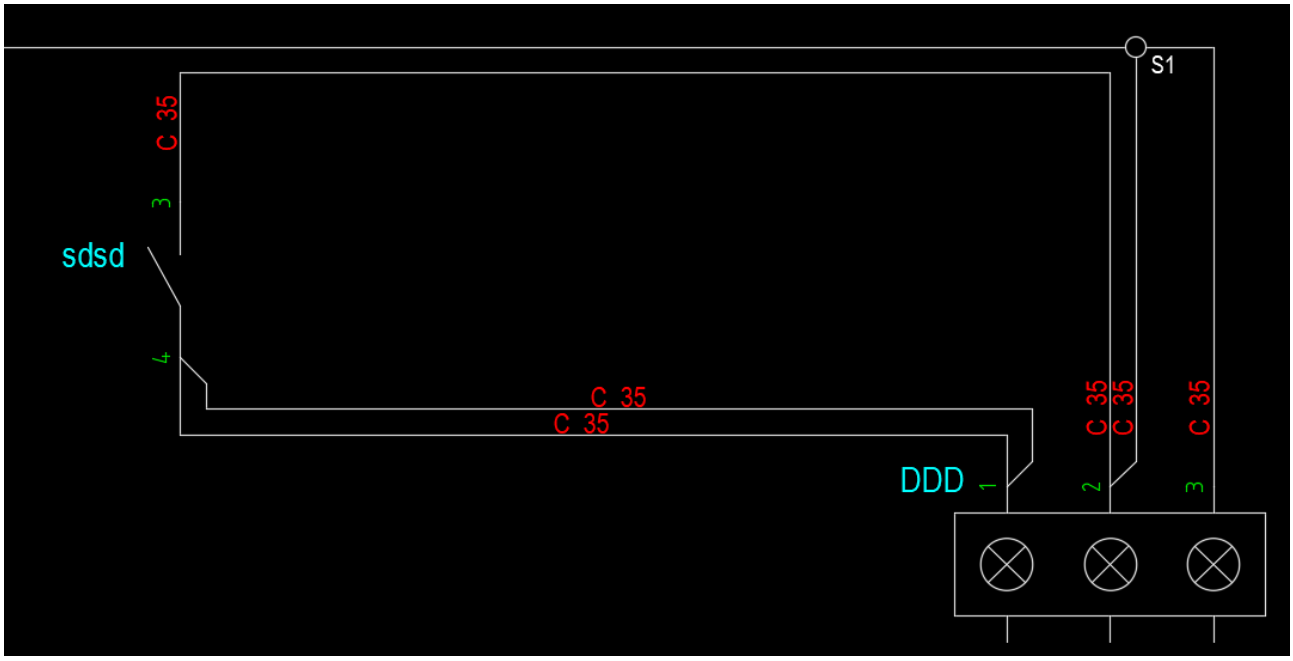
3.7 IMPORT GROUPS

In the additional commands, '4 – View Group Unions' and '5 – Update Functions' have been added, which were previously buttons on the main window. The window has been simplified and the new 'Insert and Connect' toggle has been added for Wire Terminals and Splices.

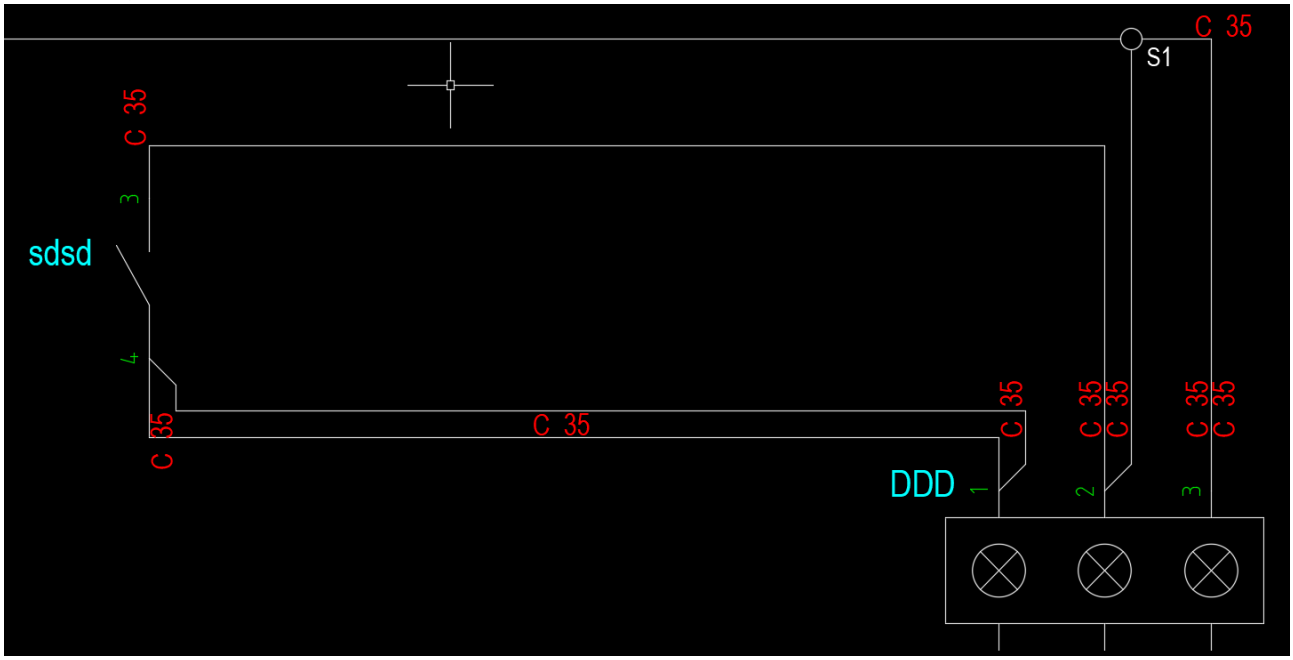


3.6 CONNECTION INDICATIONS

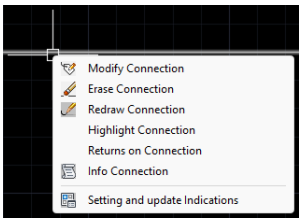
When creating connections in the wiring diagram, texts indicating the characteristics of the connections themselves are added by default. A control has been added that if a text 'overflows' beyond the line that must contain it, it is moved to the next one (if available) or deleted. In this way, drawing becomes even simpler and more correct, without further intervention by the designer.
This is the current result:



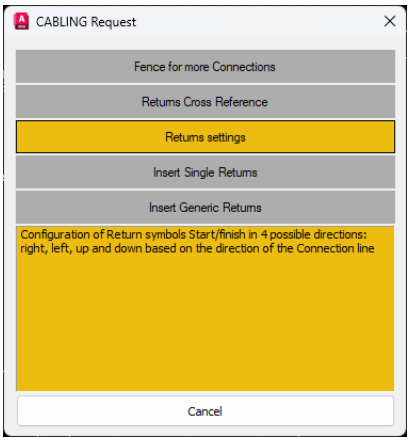
Previously this was the result:



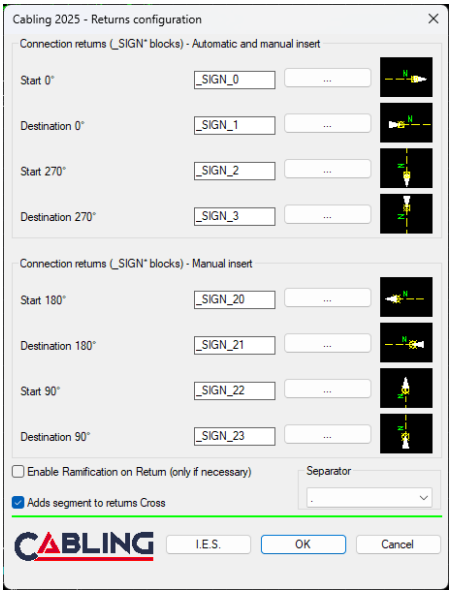
3.7 CONNECTION RETURNS CONFIGURATION



Using the 'Connection Returns' context menu option on an existing connections now opens the following menu:

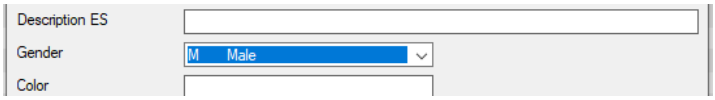


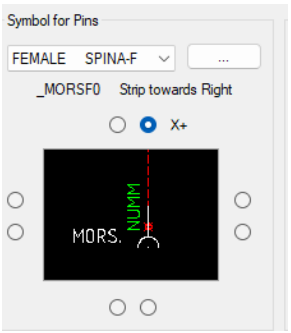
In addition to the other options, there is the one to Configure the Returns which now also includes the configuration of how to manage cross references (in the lower part of the window) and whether to enable Ramification on Cross References.

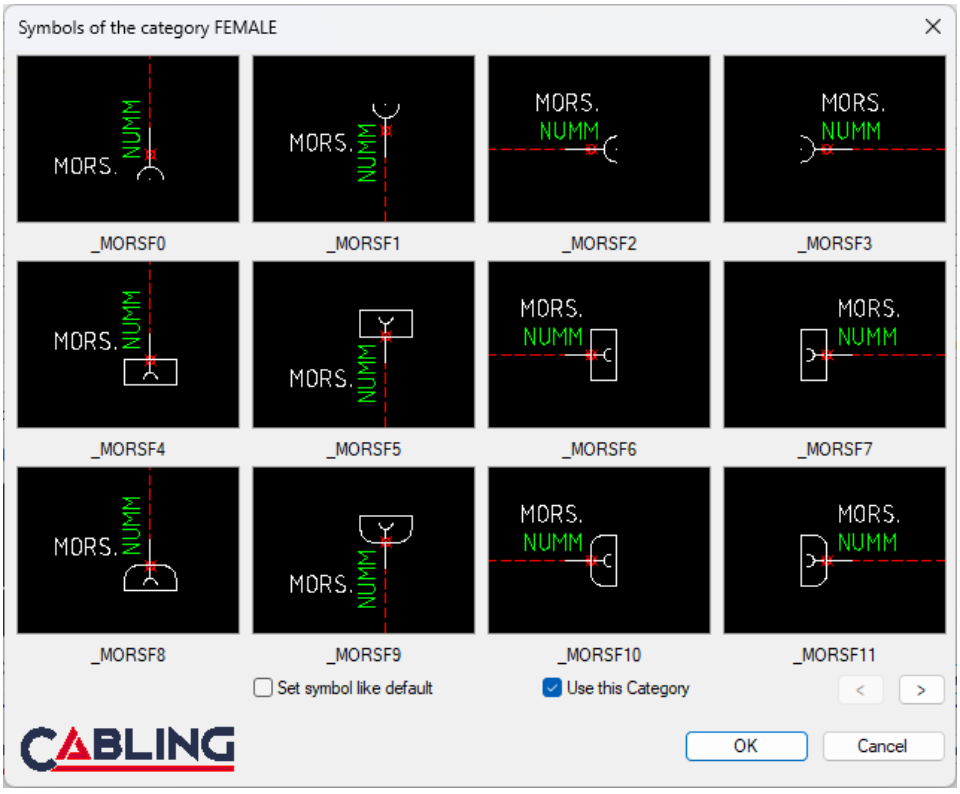


3.8 MAINTAIN CATEGORY _MORS* SYMBOLS

When choosing the graphic symbol of the _MORS* blocks, which can be activated with the button with the 3 dots (...) or by selecting the image, the selection window has a new checkbox: 'Use this Category'. Activating this box, even if you select a material to which you have associated a gender that has been declared Male or Female, the category in which the checkbox was activated is maintained (for example User).



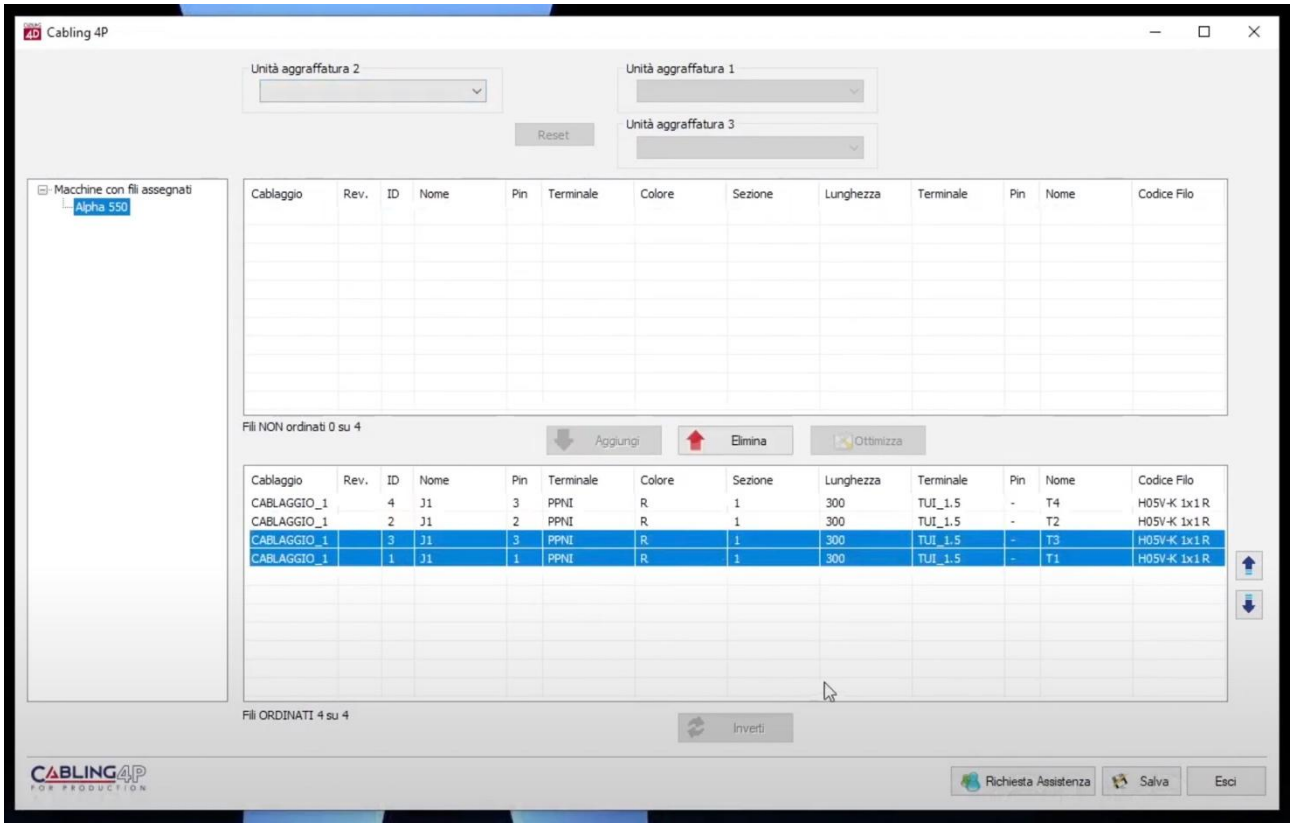




4 ATTACHMENT

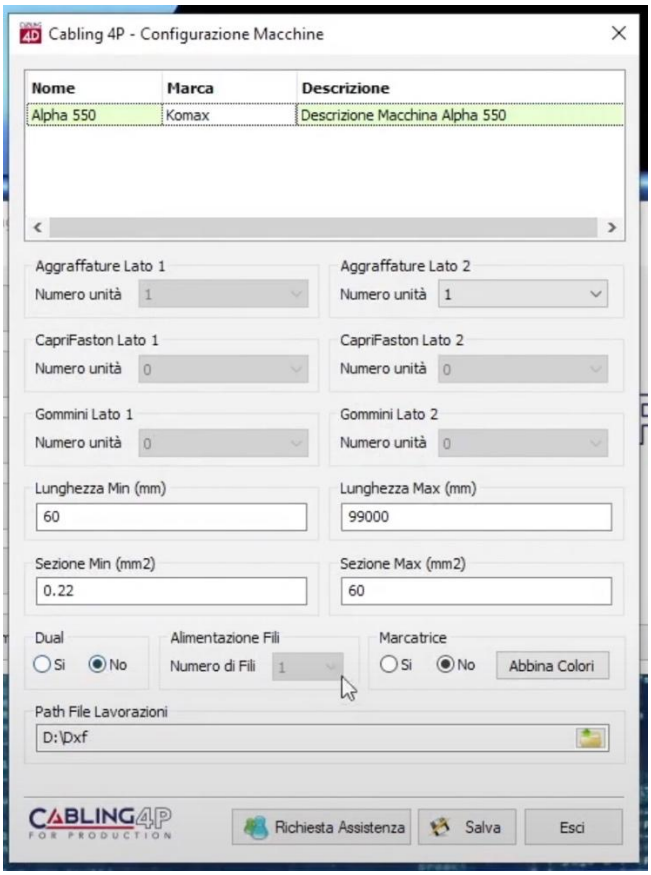
ATTACHMENT A – CABLING 4P

CABLING 4P is a standalone Windows software solution designed to optimize the CREATION and efficient MANAGEMENT of production orders in the electrical harnesses industry. The software is ideal for companies that use automatic CUT/STRIP/CRIMP machines and that seek to reduce time, errors and machine downtime in the cutting preparation process.



Main features:

Data import: direct reading of harnesses cutting tables from CAD projects created with CABLING 4D / SPAC Automazione, in addition to the possibility of importing cutting tables from EXCEL files.
Machine and applicator management: definition of automatic machines with their technical characteristics. Management of the archives of mini applicators associated with individual machines, with matching to compatible terminals.



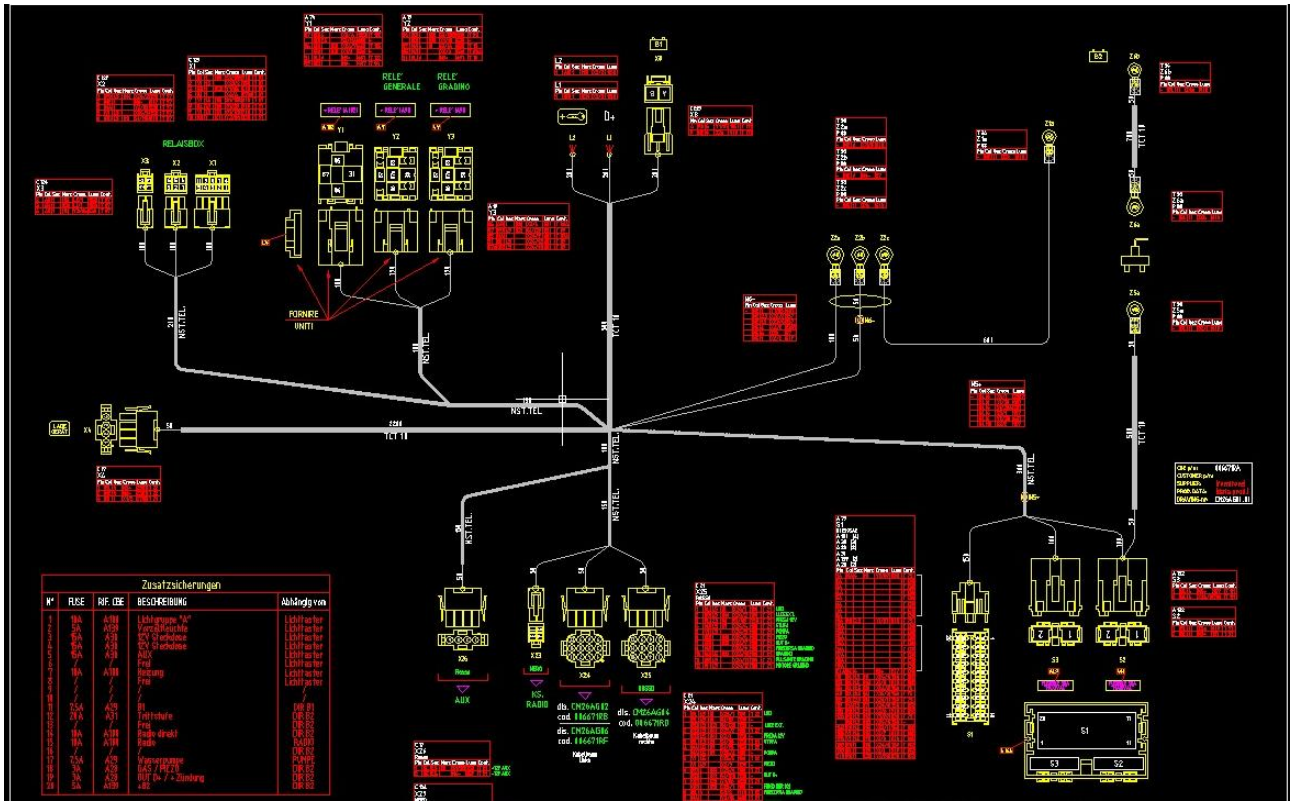
Job creation and management: creation of flexible work orders, consisting of one or more harnesses and related production batches.
Intelligent assignment: automatic assignment of individual wires to the selected machines, with control of operational constraints (presence of mini applicators, wire section, etc.)
Optimization and output: job sorting functionality to minimize setup times and maximize productivity. Generation of specific outputs for SPAC Wiring, ensuring an integrated workflow.

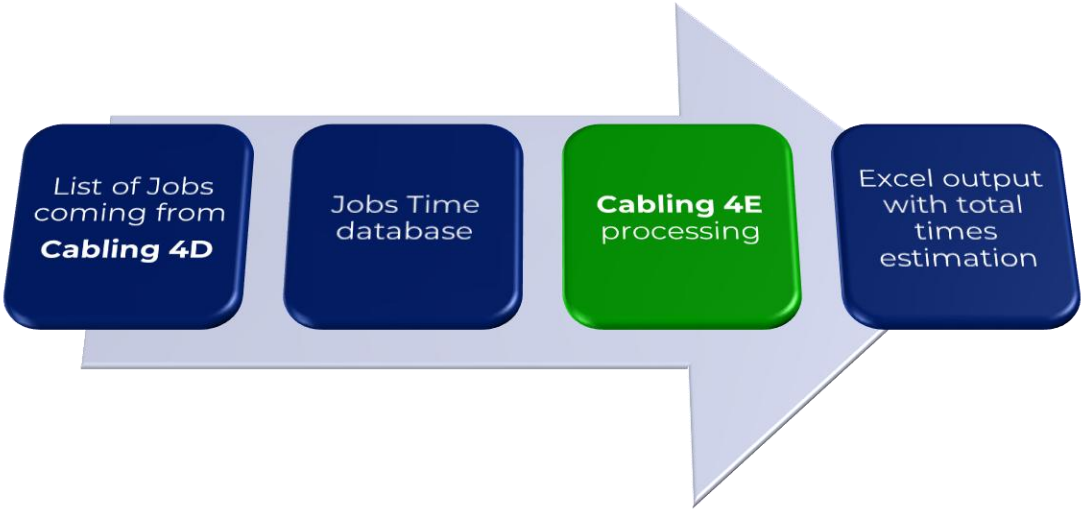
Advantages:

Time reduction: automates manual operations and speeds up the cutting preparation process.
Error Minimization: constraint control and data validation to avoid setup errors and production waste.
Operational Efficiency: Optimize machine utilization and reduce downtime, increasing overall productivity.
Integration: Integrates with CAD software such as CABLING 4D and SPAC Automazione.
Cost Control: Improve material management and reduce waste.

ATTACHMENT B – CABLING 4E

CABLING 4E, the innovative software for estimating harnesses production times, **designed to optimize business processes**. Thanks to a fully customizable time database, every detail of the harness is analyzed and compared with predefined parameters, ensuring an accurate and timely evaluation.





Main features:

Time archive management: companies can manage their time database flexibly, adapting it to specific production needs.
Detailed analysis: every detail of the harness is evaluated based on the data in the database, allowing for precise and immediate comparison.
Excel reports: generates detailed reports in just a few moments, facilitating the creation of estimates that include not only materials, but also production and setup times.

Advantages:

Efficiency in cost estimation: with Cabling 4E, companies can obtain more accurate and competitive estimates, improving economic planning.
Reduction of preparation times: automates the calculation process, allowing you to save precious time in the estimate phase.
Ease of use: the intuitive interface makes the software accessible even to those with no previous experience in harnesses management.

SHEATHS										
Category	Code	Type	Description	Qta	Time_Machine	Tot.	Time_Manage	Tot.	Time_Manual	Tot.
Taglio			Taglio Guaine	22	2	44.00	3	66.00	4	88.00
Taglio			Taglio Guaine	6	4	24.00	3	18.00	6	36.00

SHEATHS WIRE INSERTION								
Category	Code	Type	Description	Qta	Time_WithTerminal	Tot.	Time_WithoutTerminal	Tot.
			INFILARE CAVO CON TERMINALI IN GUAINA lunga fino a 200 x terminale	20	1.80	36.00	1.80	36.00
			INFILARE CAVO CON TERMINALI IN GUAINA lunga da1001 a 1500 x terminale	1	5.70	5.70	5.70	5.70
			INFILARE CAVO CON TERMINALI IN GUAINA lunga da 201 a 600 x terminale	4	3	12.00	3	12.00
			INFILARE CAVO CON TERMINALI IN GUAINA lunga da 601 a 1000 x terminale	4	3.90	15.60	3.90	15.60

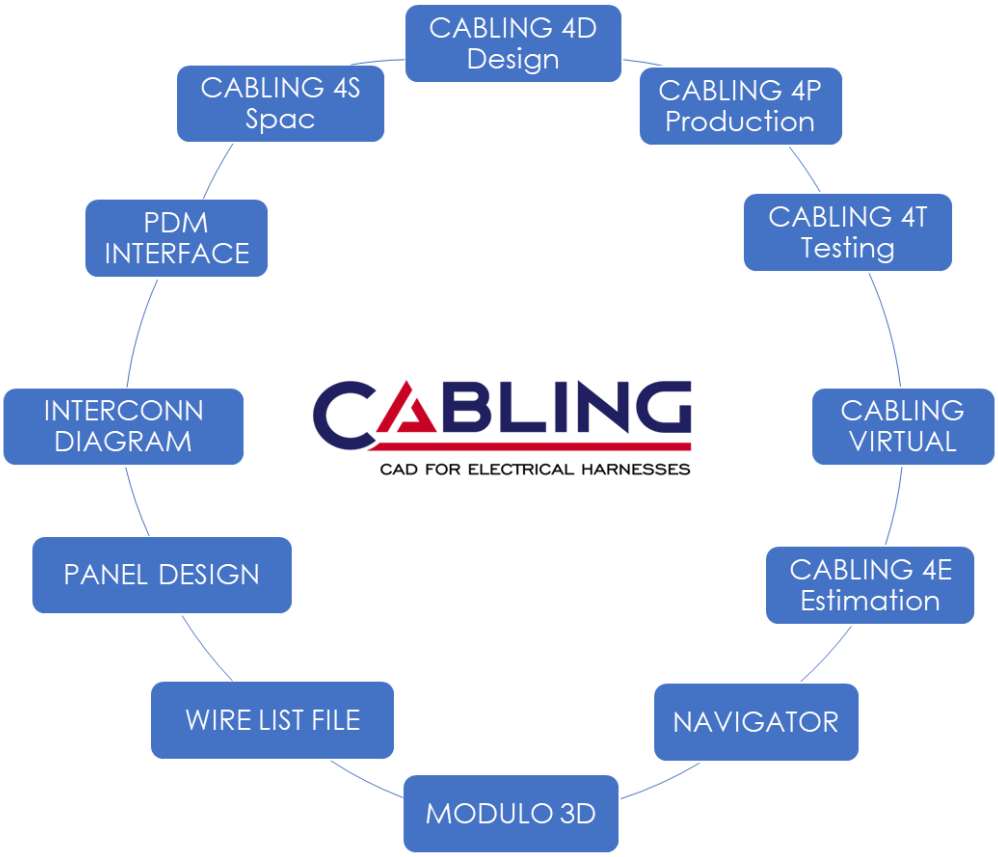
CRIMPING AUTO								
Category	Code	Type	Description	Qta	Time_Machine	Tot.	Time_Manage	Tot.
	0-54793-1			16	2	32.00	4	64.00
	0-14793-3			2	2	4.00	4	8.00
	0-282478-1			32	2	64.00	4	128.00

CRIMPING MANU								
Category	Code	Type	Description	Qta	Time_Machine	Tot.	Time_Manage	Tot.
				26	2	52.00	4	104.00
	0-282403-1			4	2	8.00	4	16.00
	1708331			3	2	6.00	4	12.00

ULTRASOUND COMPACTED								
Category	Code	Type	Description	Qta	Time_Crimping	Tot.	Time_Welding	Tot.
	0-444777			12		0.00		0.00

LAYING								
Category	Code	Type	Description	Qta	Time	Tot.	TimeRemove	Tot.
	CONNECTOR		POSIZIONARE CONNETTORE SU TAVOLA	177	5	885.00	1	177.00
	TERMINAL		POSIZIONARE TERMINALE SU TAVOLA	3	1.08	3.24	1	3.00

ATTACHMENT C – CABLING WORLD



ATTACHMENT D – VIDEOS

CABLING 4P
https://youtu.be/xtAvOZzpv5E
https://youtu.be/Lcz12xMteyM

CABLING 4T TESTING
https://youtu.be/sHW_YI4u6k8
https://youtu.be/NgAFWBJm20I

3D MODULE
https://youtu.be/lfT-aeiGNm4?feature=shared
https://youtu.be/5GgEsW7UbSg?feature=shared
https://youtu.be/SsOYt_28KDo?feature=shared
https://youtu.be/-L7crhNBK9s?feature=shared
https://youtu.be/l2Ykq27RD78?feature=shared
https://youtu.be/Y6fpVnxpR8M?feature=shared

CABLING VIRTUAL
https://youtu.be/hCvKWTNhSwU

NAVIGATOR
https://youtu.be/GwRE5E7u5GI

WIRE LIST FILE
https://youtu.be/nA6tBI_xjH8

PANEL DESIGN
https://youtu.be/RWlNWoUIEfU

SPAC TO CABLING
https://youtu.be/BWDwLqGhgLU