

WELCOME

Welcome to the world of ProAnt. This manual describes synthetically the main features and functionalities of the software ProAnt. We assume some familiarity with the Windows framework. In the rest of the manual we describe the windows that the user is faced with and the commands that are available.

WARNING

All information included in this manual is subject to change without warning. Although all data included in the manual and the software have been checked, we do not exclude presence of errors. In case some errors are found we will solve them by issuing a free patch on our web site.

ProAnt (developer and distributor) declines any responsibility for damages that the user may have due to errors in the software.

TECHNICAL ASSISTANCE

If you need technical assistance you can contact the representative in your country. To have a list of our representatives you can visit the web site www.proant.com. If there is no representative in your country you can send email to proant@proant.com. In order to have technical assistance your licence must be registered. **It is important to read this manual before seeking assistance.**

UPDATES

On our web site www.proant.com you can find updated versions of the libraries of ProAnt and also updated versions of the software. We advise you to check periodically our web site to ensure that you are using the most updated version of ProAnt. To check whether the version of ProAnt you are using is the most updated you can compare the version of ProAnt that appears on our web site with the version that appears in the info window of the software installed in your computer.

IMPORTANT NOTE ABOUT THE KEY

To avoid damages to the keys or to the computer **do not use two keys of ProAnt on the same computer and do not insert the key in the serial port.**

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1 Basic Elements of ProAnt

1.1 *Installation and first run of ProAnt*

In this section we describe all the necessary operations for the installation of ProAnt and the typical problems that you may encounter. It is important to follow the instructions below if you want to obtain the maximum performance from your computer. Please **do not seek technical assistance if you have not read the instructions below**.

Software installation: ProAnt is provided on a self-installing CD-ROM. After inserting your CD in the reader, the installation program will start automatically. If auto-notification is disabled in your computer, then you will have to run manually the program Setup.exe from the CD-ROM.

The installation software asks the user for information about the destination folder, the name of the folder in the start menu, etc. Typically it is sufficient to confirm all requests. At the end of the installation the computer shows an informative window. You can simply press the **Finish** button.

Installation of the hardware key: ProAnt does not start if you do not insert the provided hardware key in one of the parallel ports of your computer. You can insert the key between the parallel port of your computer and the printer cable. It is advisable to fix the screws of the key and of the printer cable to avoid malfunctions.

Important: do not connect the key to the serial port of your computer and do not use two keys of ProAnt at the same time. These operations could cause serious damages to the key or to the computer.

Installation of the driver for the key: If your operative system is not based on NT technology (Windows 95/98/me), then you can skip this point. If your operating system is Windows NT/200/XP, then you need to install the driver of the key. To install the driver, you must login as Administrator and run the program GssAdd.exe in the folder Drivers\NtDrv of the installation CD of ProAnt by a simple double click of your mouse. If the driver is not installed, then ProAnt will give the following error: "You must run the utility GSSADD!". If this happens, simply run the program GssAdd.exe as described above.

Monitor configuration: For the correct functioning of ProAnt the screen must be configured with a configuration of at least 800x600 pixels and that the screen characters are set to small. If your computer is recent and you have not changed any

configuration parameter, then the screen should be configured correctly already. The typical symptom of a wrong configuration of the screen is that you cannot see the entire window of ProAnt.

Configuration of the parallel port: For the correct functioning of ProAnt the parallel port must be configured in SCP mode, and in any case in no mode that includes ECP. The configuration of the parallel port usually requires you to access the BIOS of your computer and it is advisable that this operation is performed by an expert. In any case you can try to run ProAnt without verifying the configuration of your port and address the problem only if ProAnt hangs and reports the message that the key is not present. As just said, the typical symptom of a wrongly configured port is that ProAnt hangs as soon as the parallel port is used by some other application, e.g., a printing application.

Personalization of ProAnt: The first time you run ProAnt you will see the Personalization window, where you insert the data of your company. The personalization data are used by ProAnt to show your company info on the screen and on all printouts. To confirm your data just press the Ok button. At this point the computer takes about 15 minutes to initialize the key. The personalization can be modified at any time; however this operation always requires 15 minutes.

1.2 Main Window

ProAnt works in two basic modes: **draw** and **compute**. In draw mode the user can draw schemas of distributions and headends; in compute mode the user can specify the technical and commercial data of the components, evaluate the correctness of a project, prepare estimates of expenditures, and print all necessary documentation. Modes can be switched by means of two buttons located in the lower part of the screen. Button Forward switches from draw to compute mode; button Back switches from compute to draw mode. Switching to compute model is possible only if the drawings of distribution and headend are correct. Normally correctness means that all inputs and outputs of the components are connected to outputs and inputs, respectively, of other components or to loads. In case of errors ProAnt gives appropriate explanations.

The main window of the program consists of a series of folders. In draw mode there are two visible folders named **Distribution** and **Headend**, while in compute mode there are other folders depending on the data given by the user. If your software includes the mast module, there is another folder, named **Mast**, which contains data for the design of the external mast.

There is an alternative way to create a project that skips completely the draw mode. The corresponding function is called **project wizard** and can be selected through the Tools menu. See section 5 for a description of project wizards.

2 Distribution and Headend Folders

2.1 *Distribution and Headend Folders in Draw Mode*

The Distributions and Headend folders can be used to draw the schemas of the distribution network and the headend, respectively, of a plant. Both folders contain a grid, a component toolbar located on the top of the screen, and a component panel located on the left of the screen (only Professional edition). To place a component on the grid it is sufficient to select the component from the component toolbar and click on the square (called cell) where the component should appear. There are some important aspects to keep in mind.

- Not all components are available everywhere. For example, it is not possible to insert an active filter in the distribution. The buttons for components that cannot be inserted in a drawing are disabled (light gray color).
- Some components can be rotated either by pressing the button **Rotate** that appears in the component toolbar or by clicking with the right button of the mouse when the cursor is on the grid.
- Some components can be reflected by pressing the Mirror button that appears in the component toolbar.
- It is possible to draw cables by pressing the left button of the mouse on the first cell of the cable and tracing the cable while holding the mouse button. Crossings are handled automatically.
- Some components use more than one cell.
- The data of some components can be changed in draw mode. Such components can be noted by the presence of one or more scroll boxes that appear in the component toolbar. For example, the number of inputs and outputs of a switch can be changed, and the color of the cables can be changed.
- When a component is inserted in a cell that contains another component, the previous component is removed. An exception is the case where a linear cable is inserted in a cell that contains an orthogonal linear cable. In this case a crossing is created.

It is possible to remove components from the drawing by selecting the eraser. In case a cable is removed from a cell that contains two cables, the closest cable to the cursor is removed. To remove more components, select the eraser, press the left button of the mouse on a cell, and move the cursor on the other components to remove by holding the mouse button. In case the cursor reaches a cell with two cables, the cable to remove is determined based on the cell the cursor is coming from.

By selecting the arrow button on the component toolbar it is possible to use that cut and paste functions that we describe later. At any time the user can cancel some of the latest operations. The number of operations that can be canceled depends on the memory available.

Sometimes it may be necessary to change the color of a whole cable. In such case it is possible to select the cable button in the component toolbar, select the desired color in the color scrollbox that appears, hold the ALT key, and press with the left button of the mouse while the cursor is on the cable to recolor.

The first row of the distribution and the last row of the headend are special. These rows contain a box (a rectangle) with one or more connections that represent the headend and the distribution, respectively. Headend and distribution can be connected by at most 20 lines (9 for the light edition). To change the number of connections click on one of the boxes with the right button of the mouse. It is not possible to draw components on the special rows.

In the Professional edition it is possible to insert textual and/or graphical elements in the drawings by selecting the appropriate buttons on the left side of the components toolbar. To place a textual element, select the text button on the components toolbar, click with the left button of the mouse on the desired position, and type the desired text. To place a rectangle or a line select the corresponding button on the components toolbar, place the cursor on a starting point, press the left button of the mouse, move the cursor to the end point, and release the left button of the mouse. All the textual and graphical objects can be modified and moved by selecting the arrow button on the components toolbar, clicking on the desired components, and dragging the components or its anchors to the desired locations. To modify some text, click a second time on the textual object after selecting it. To modify the attributes of a graphical object (e.g., color, thickness, font, etc.) simply select the component and then select the desired attributes from the scrollboxes that appear in the components toolbar. It is possible to select more than one object by holding the CTRL key.

Note: when the zoom is active some textual objects with small font sizes may not be shown correctly on the screen.

The cut and paste functions are available from the **Modify** menu when the arrow button is selected. To copy a part of a drawing, select the desired area with the mouse and select the command **Modify|Copy**; to paste the area just copied, select the top-left cell of the destination region and select **Modify|Paste**. It is possible also to cut and eliminate an area. Also, there is a function **Paste Mirror** that mirrors the

contents of the copy buffer before pasting, and a function **Paste Rotated** that rotates the content of the copy buffer before pasting. Some important points:

- It is not possible to select cells from special rows and it is not possible to paste on special rows.
- Components that are partially included in a selected area are copied.
- Not all components can be mirrored or rotated. These components are pasted with the original orientation.
- Functions Paste Mirror and Paste Rotated are not available in the headend.

In the professional edition it is possible to change the grid dimensions of distribution and headend by selecting the command View||Grid sizes. Each grid must be of size at least 50x50 cells and must be able to contain the current drawings.

The components panel on the left of the screen contains a tree structure that has names of companies at the top level. Each name of a company corresponds to a library. By searching through the tree it is possible to find the components contained in the libraries. The components to draw can be selected through the components panel as well. It is enough to use ProAnt a few times to discover the advantage of this alternative selection mode. A first advantage to note is that when you switch to compute mode the technical and commercial data of the components are already described.

Once the drawings are complete, press the Forward button to switch to compute mode. Possible errors are shown. If there is no error, the component toolbar and panel are hidden and numbers all the components. If a user is not interested in a part of a project (distribution or headend), it is possible not to draw the undesired portion. ProAnt recognizes this situation when switching from draw to compute mode and removes the unnecessary folder.

2.2 Distribution and Headend Folders in Compute Mode

In compute mode all components are numbered. The numbers can assume three colors: colors red and blue are relative to components that are not described completely yet; color green is relative to components that are completely described. The description of a component consists of technical data (e.g., attenuations, gains, noise figures, etc.) that are necessary for the computations, and commercial data that are necessary for the estimate of expenditures. The data of components numbered in blue are not necessary for the calculi but are necessary for the estimate of expenditures. To view and modify the data of a component click on the component with the left button of the mouse: the data window appears. The structure of the data

window depends on the selected component. It is possible to copy the data of a component to similar components. To do so, click on a component with the right button of the mouse and select functions **Copy to** or **Copy to all**. In the second case the data of the selected component are copied to all the similar components; in the first case a window appears where the user can select the components where to copy the data. Alternatively it is possible to hold the ALT key and click on any component. In this case the data are copied from the last similar component that was described.

2.2.1 The Data Window

The generic component data window contains a grid of 0 to 15 rows and 11 columns (one for each band) that contain numerical data. The number of rows and their contents varies with the components. Each element of the grid can be empty, contain a number with up to two decimals, or contain the symbol “*”. The empty element means that the component described cannot handle the corresponding band; the symbol “*” typically means that the component attenuates completely any input signal. In the following we will indicate explicitly those points where “*” has a different meaning. In the components with regulations it is possible to use the symbol “<” as well, whose meaning will be described later.

It is not possible to input data only in some of the elements of a column. If this happens, ProAnt reports an error.

Besides the grid, the data window contains other fields that are needed for estimate of expenditures and lists of materials. These fields are the code, the article, the series, the brand of the component, a short description, some notes, the price and currency, and the time required for installation expressed in minutes. On cables the price and installation time is relative to a linear meter of cable. In the Professional edition there are other two lines of **connected components**. In these lines the user can include other components that are normally associated to the current component and do not appear in the drawing. For example, in a tap with F connectors the necessary F connectors can be included automatically in the list of materials.

We now describe the required data for each kind of component.

- *Passive components*: all passive components contain 1 up to 4 rows, depending on the kind of component. For example, a tap with four taps contains four rows (In-tap loss, Insertion loss, Tap-out loss, Isolation) that correspond to the attenuations and isolations of the component at the different bands.
- *Cavi*: a cable contains a line for the attenuation introduced by 100 meters of cable plus a required field for the length of the cable. By inserting “*” in the length field the cable is not numbered in the drawing and is not included in the estimate of

expenditures. The length * is useful whenever a cable is drawn simply for graphical elegance or the same cable is drawn in the headend as well as the distribution.

- *Amplifiers:* an amplifier has a gain control line that corresponds to an attenuation of the input signal, a maximum gain control line (only for amplifiers with regulation), a gain line that corresponds to the signal gained by the amplifier, a noise figure line, and a maximum output signal line. ProAnt determines the maximum output level of an amplifier based on the values in the maximum output signal line and the number of channels that are amplified. Some amplifiers may be constituted by more than one amplifier (for example one for each input line). In this case the data of each amplifier must be specified separately. The component data window contains an area where it is possible to identify the amplifier currently described. The maximum gain control line contains the maximum level of gain control for each band. Typically amplifiers with gain control permit to control the gain of several bands with a single regulation point. In this case it is possible to use the symbol "<" to indicate that the gain control of the current band must be the same as the gain control of the band to the left. The gain control line contains the actual value of gain control, which should be consistent with the contents of the maximum gain control line. Some functionalities of ProAnt set the value of gain control automatically.
- *Switch:* besides the attenuation and isolation lines, a switch includes also the typical lines of an amplifier. This is because there are several switches equipped with amplifiers. If there is no amplifier in a switch, the line that describe the amplifier should be filled with "*".
- *Active modules:* active filters, modulators and converters contain fields that describe their frequencies of operation, which can be specified by giving frequencies explicitly or by selecting a channel in the corresponding menus. In a converter it is possible to specify the type of conversion: channel/channel, IF/IF, 4QPSK/64QAM.
- *Large band amplifiers:* large band amplifiers are the same as an amplifier for each input line followed by a mix. For each input line it is necessary to describe the corresponding amplifier. If an input line is simply mixed with the output, it is sufficient to insert 0 in the gain control and gain lines.
- *Mix and demix:* mix and demixes are described by as many attenuation lines as inputs or outputs. If the number of inputs or outputs is 2, then it is possible to exchange the contents of the lines by pressing the button Exchange.
- *Satellite converters:* a satellite converter is described one output line at a time. Each output lines can be described in two ways: either by giving the output levels of five reference channels called Sat1 – Sat5, or by giving a list output channels

(fundamental for IF distributions). Each channel is described by its minimum and maximum frequency, its name, the measured signal, and the measured noise figure.

- *Antennas*: antennas are described by giving the frequencies that they can manage and the list of received channels with corresponding measured signals. Channels can be described by referring to the predefined channels of ProAnt. The professional edition of ProAnt includes also data about the wind pressure in the antennas, which are used to design the external mast.
- *Dishes*: dishes contain only data to estimate the wind pressure.

2.2.2 Use of libraries

The data of a component can be input by using libraries, which contain the descriptions of several components. To insert in a library the current data of the component data window, press the button **Add**. The Code field should not be empty to insert a component in a library. To update the data of a component that is already in the library, press the button **Update**. To eliminate a component from the library press the button **Eliminate**, making sure that the code of the component to eliminate appears in the menu located in the lower part of the screen. To retrieve the data of a component from the library it is sufficient to select its code in the menu located on the lower part of the screen.

It is possible to use several libraries. For example it is possible to use a distinct library for the components of each company. To use a library it is necessary to open or create it. This is possible through the **Options** dialog window, which can be shown with the menu command View|Options.

ProAnt is provided equipped with several libraries of known companies. All libraries can be modified by the user. We advise the user not to modify the libraries included in the CD of ProAnt since the modifications would be lost during future updates of the software. Rather, it is more convenient to create personal libraries, possibly copying components from the libraries included in ProAnt.

2.2.3 Component Selection Wizard in Passive Distributions

When the size of a distribution is large, choosing the exact components to use is quite complex. To simplify the problem ProAnt is equipped with a function that chooses automatically the components of a distribution so that all outlets are served with the minimum possible signal from the headend and so that the difference of signals between outlets is minimal.

The component selection wizard is enabled only when the distribution does not contain any active component, with the exception of switches, and all cables are described (no cable is numbered in red). The function is available from the Tools menu. In the dialog window that appears, the user can select the components to use by means of a tree that includes all available components. It is possible to save up to four selections to speed up the use of wizards in future projects. By pressing Ok ProAnt calculates the distribution using the components selected. If the wizard is successful, then ProAnt reports success, otherwise ProAnt explains the reasons of the failure. Component selection wizard optimizes the signals of a single band that is selected by the user. To view the results for the other bands select the folder Distribution Calcoli.

The default reference band used by component selection wizard is band V, which permits to obtain satisfactory results. Sometimes the distribution is balanced better by selecting the band Sat1 as reference band.

Note: sometimes the component selection wizard is not enabled because some cable is not defined yet. In very large distributions it may be difficult to identify the missing cable. For this purpose there is a function in the **Find** menu, which permits to identify an undefined cable. Similar functions are available to identify undefined components that are necessary for calcoli or for estimantes.

3 Calculi Folders

The calculi folders provide information about the signal required and that circulate through a distribution and /or headend. They are visible only where components necessary for the calculi are described.

3.1 Distribution Calculi Folder

The distribution calculi folder is visible when no component in the distribution is numbered in red. It contains the results of the calculi that ProAnt perform to establish whether the distribution conforms to the regulations. ProAnt computes the minimum and maximum signals at the headend so that all outlets are served, and based on such signals it computes the signals that would reach each outlet. It then verifies whether the differences of signals at the outlets and the isolations.

The first part of the folder contains a list of controls performed and the results of the controls. The second part of the folder contains a table with the minimum and maximum signals at the headend to serve all outlets. The possible values are the following:

- Numerical value: indicates the actual value of the minimum or maximum signal.
- star: indicates that no signal is possible. If the star is blu, then some component in the distribution does not handle the band; if the star is red, then all components handle the band, but no signal is suitable to serve all outlets. Usually a star is ok if the corresponding band is not meant to be used.
- unlim: any signal is ok. Usually this is an anomaly since no outlet is reachable from the headend. A cause of unlim is a component that attenuates completely its input signal.

The data of the return channel are reversed, and contain the minimum and maximum signals that need to be provided to the outlets so that there is a sufficient signal at the headend. All reference signals can be set from the Options windows which can be shown using the menu function Show|Options.

The thirs part of the folder contains a table with the minimum and maximum signals at each outlet based on the minimum and maximum signals at the headend computed before. The possible values are the following:

- numerical value: to indicate actual values of minimum and maximum signals.
- star: to indicate that no signal reaches the outlet.

For the return channel the table report the minimum and maximum signal to input to the outlet so that a sufficient signal reaches the headend.

If the isolation between some outlets is too low, the end of the folder contains a few examples of outlets with insufficient isolation. The low isolations are indicated in red. A star means that the isolation is infinite.

3.2 Required Distribution Calculi Folder

The required distribution calculi folder is visible whenever there are no components in the distribution that are numbered in red. It is used normally to identify the causes of problems identified via the distribution calculi folder. The folder is initially empty. To show some calculations it is necessary to give the appropriate command from the Calculi menu. We now describe each kind of calculi. The results are written for all relevant components scanning the component grid from top to bottom and from left to right.

3.2.1 Attenuation to outlets

This calculi show the attenuations from the headend to each outlet. They do not give any additional information compared to the distribution calculi; however, sometimes attenuations are easier to understand than minimum and maximum required signals. At the beginning of the results there is a table containing, for each band, the best and worst served outlets, their attenuations, and the difference in attenuation. This information is useful to understand how balanced is the distribution.

3.2.2 Limit signals to components

This calculi compute the minimum and maximum signals required at the entrance of each component so that all following outlets are served. These calculi are useful to identify sources of problems found in the distribution calculi folder. NSuppose that from the distribution calculi an input line does not admit any input signal on a band that should be served. The cause of the problem is on some of the components that appear later in the distribution. To identify such component, it is sufficient to compute the limit signals to the components and, starting from the bottom of the folder, identify the first component that has an undesired star.

3.2.3 Isolation between outlets

This calculi give all isolation between any pair of outlets. Note that for large distributions that amount of information to write, and consequently the elaboration time, could be very high.

3.3 Channel Calculi Folder

The channel calculi folder is visible only when all components are not numbered in red. It shows the channels that leave the headend and that reach each outlet. The

data of each channel includes the name, a description, the minimum and maximum signals, the minimum and maximum noise figures, and the antennas the channel is received from (origin), including conversions if any. An example of origin for a channel A is H[25[An1]], which means that channel A was received by antenna An1 as channel 25, then converted into H and converted further into A.

The channel calculi folder is divided in two parts. The top part contains the data described above; the bottom part contains a list of errors that are found. These errors may reveal anomalies in the project.

3.4 Required Channel Calculi Folder

The required channel calculi folder contains the same data as the channel calculi folder, except that the channels are shown for each component. To emphasize how the active filters work, the channels that an active filter can handle are shown in purple color.

3.5 Calculi via Dynamic Test Pointing

It is possible to view the results of all calculi relative to any point in a headend or distribution by using dynamic test-pointing. Simply place the mouse in the desired point and wait for the test-point window to appear. This functionality is very useful to identify errors quickly.

4 Estimates of Expenditures

Once all components are described (they are numbered in green), ProAnt can prepare automatically an estimate of expenditures. Labor is computed by summing all installation times of all components and connected components.

4.1.1 Estimate Folder

The estimate folder contains a table with the list of all components included in a project and an estimate of labor. The user can modify all quantities and/or prices, and the estimate is adjusted accordingly. It is also possible to add other components to the estimate by clicking on the first free line of the table. Finally, it is possible to eliminate one line of the estimate (only the lines added by the user) by using the appropriate function from the Modify menu.

ATTENTION. Any modification to the lines of the estimate that are computed automatically by ProAnt are lost whenever the project is modified. It is advisable to modify the automatic part of the expenditure only when it is strictly necessary.

4.1.2 Currencies

ProAnt permits to prepare estimates in several international currencies and to convert automatically an estimate to other currencies. To convert an estimate it is sufficient to select the new currency from the menu that appears in the estimate folder. The conversion occurs only if the conversion rates are defined in the program. To insert or change some conversion rate select the Currency folder from the Options window, which can be shown with the menu command View|Options. The default currency can be set in the same window.

4.1.3 Window to Add Elements to an Estimate

To add components to an estimate click with the mouse on the first free line of the estimate. The Add window appears. The user can insert data manually or select components from a library. The button To Estimate can be used to add the current component to the estimate without closing the window.

5 Project Wizard

Project wizard, available from the Tools menu, is a function that permits to design a plant in a completely automated way. With project wizard you can design terrestrial, satellite, and mixed distributions and headends. The terrestrial and satellite plants can be merged or separated. The satellite plant can be IF, multiswitch, with a radial structure, or with the multiswitch along the stairs, or with the multiswitch inside the apartments. The reference building for the design can have up to four stairs, up to twelve floors with up to six apartments per floor. Each stair is designed if it is possible to serve all outlets by splitting the plant in at most three parts. No splitting is allowed for multiswitch based plants.

The user describes the kind of plant to design by means of some simple masks. On the first mask the user describes the kind of plant to realize (terrestrial, satellite, or mixed), the elements to design (distribution or headend and distribution), the structure of the terrestrial headend (large band amplifier or active filters), the number of lines of the satellite plant (single cable or multiswitch), the structure of terrestrial and satellite plants (merged or separated), and the structure of the multiswitches (along stairs, within apartments, radial).

On the second mask the user describes the structure of the building. The right part of the mask contains several numerical data that describe the building, such as number of stairs, number of floors, number of apartments per floor, distance between floors, number of outlets per apartment, etc. The left part of the mask contains a schematic representation of the building. The variation of any numerical data affects the whole building. However, it is possible to select a single apartment from the left side of the mask, or a single floor, or a single column of apartments and then modify the data of the selected apartments only. In this way it is possible to describe buildings with heterogeneous structures.

On the third mask the user describes the antennas of the plant, the received channels, and the measured signals. This mask is visible only if a terrestrial headend has to be designed. Each antenna is selected by means of two menus, one for the library and one for the code. Channels are selected by clicking the mouse on their name. Each channel is shown with a white background if it is not selected and is managed by the antenna, with a gray background if it is not selected and is not managed by the antenna, with a yellow background if it is selected and is managed by the antenna, and with a red background if it is selected and not managed by the antenna. Descriptions of channels and measured signals can be input on the table that appears beside the channels. It is not strictly necessary to input descriptions and/or measured signals, since ProAnt sets measured signals to typical values. The selected antennas can be saved in one of the available pre-set settings for future reuse. The current setting can be saved via the menu function Save.

On the fourth mask the user describes the satellite packages to receive. This mask is visible only for IF headends. Each package can be selected by clicking on the name. On the fifth and last mask the user selects the components that can be used to design the plant. The cables to be used in the different places of the plant are described by giving the reference library and code; the connectors of the outlets are described by means of menus, all other components are selected through a tree. Typically a whole library is selected; however sometimes it is possible to obtain better results by selecting components from more than one library or by selecting only some of the components of a library.

Once all masks are compiled ProAnt creates the plant and reports all errors that possibly arise. The plant designed by project wizard can be modified by the user at any time.

6 Mast Folder

The mast folder is divided into two parts: the left part of the folder is reserved to numerical and textual descriptions, while the right part contains a schematic representation of the mast and its components. The left part of the folder is further divided into four sections: one section for the description of the environmental conditions, one section for the description of the antennas, one section for the description of the segments of the mast, and one section for the global evaluation of the design. Initially the evaluation section is red and reports a message “segment 1 not completely described”, which means that the mast is not described yet. Once the description of the mast is completed, the evaluation section can be green, meaning that everything is correct, light blue, meaning that a static analysis of the building is necessary, and red, meaning that there are some design errors.

6.1 Description of the sections of the Mast Folder

6.1.1 Environmental conditions

The environmental conditions are described by environment, wind, and altitude of antennas.

1) *Environment*

The environment can be **normal** or **adverse**. In case of normal, the wind menu is not enabled: the wind speed is set to be 130 Km/h if the antennas are within 20 meters from the ground and 150 Km/h otherwise.

2) *Wind*

The wind menu is enabled only when *Environment* is set to adverse. In this case it is possible to select a wind speed among 130, 150, 160 and 200 Km/h.

3) *Antenna system*

In this menu it is possible to select the height of the antennas with respect to the ground: **within 20 meters from ground** or **above 20 meters from ground**.

6.1.2 Antennas data

The antennas data section is described to the description of each antenna, which are the received bands, the divergence with respect to the antenna immediately below, the polarity, and the wind speed. The type of antenna can be selected by pressing the corresponding button, while the other data is selected by menus. The divergence

is not enabled for the first antenna of a mast and for dishes. The polarity is not enabled for dishes.

The wind pressure can be described by specifying the actual pressure in Newtons given a specific wind speed, or by specifying the surface of the antenna. In a dish it is also possible to specify the diameter.

6.1.3 Mast data

A mast is made of up to six segments. The segments can be either telescopic or with joints. To describe a mast, first the number of segments is selected, and then the data of each segment (diameter, thickness, length) is described. ProAnt verifies immediately whether the segments fit together correctly.

6.1.4 Mast Schema

The drawing of the mast is divided into two parts. On the left part there is a line that contains all the antennas, including quotations of their positions and relative data. Besides the distance between the antennas there are the minimum distances required by the regulations, which are colored in blue. The actual distances are green if they are not lower than the required distances, and in red if they are lower than the required distances.

The right part of the drawing represents all the segments of the mast, including the valuation of the joints, the bending moments, and the resistances modules. If some fixes are needed, their position is represented by red lines. If there are insufficient data to compute some values, the values are replaced by “???”.

6.2 Building a Mast

To build a mast it is sufficient to place the antennas on the left line of the drawing, describe the structure of each antenna, and describe the mast segments. In real time ProAnt computes and prints all required data and emphasizes design errors or problems.

6.2.1 Inserting new antennas

To insert a new antenna select the button “New antenna”, move the cursor to the place the antenna should go, and click. To add antennas with branches place the branches first.

6.2.2 Modification of antennas data

When the arrow button is selected it is possible to modify the data of each antenna. Just select each antenna and modify its data in the antennas data section. To move an antenna just drag it with the mouse. When the mouse is close to some antennas,

the right button enables two important functions: *bring to minimum distance*, which brings the current antenna to the minimum distance with respect to the antenna below, and *bring all to minimum distance*, which brings all antennas to the minimum distances. Note: although there is no minimum required distance between dishes and other antennas, ProAnt sets the minimum distance to the radius of the dish plus 10 centimeters.

6.2.3 Modification of the segments data

To describe the segments of the mast it is necessary to specify whether or not they are telescopic by clicking the corresponding check box, select the number of segments, and edit the data of the segment in the table that appears on the screen. If the segments are telescopic, it is possible to increase the lengths of the joints by dragging the segments with the mouse. The advantage is that the mast becomes shorter and the wind pressure decreases.

6.2.4 Walking ground

ProAnt assumes by default that the walking ground is at the higher fix of the mast. However, there are cases where the ground is in another places. For example a dish may be fixed between the two fixes of the mast. It is possible to move the walking ground either to the lower fix or to any arbitrary point. To do so, right click the mouse and select the location of the walking ground on the menu that appears. In case of walking ground at arbitrary points, the ground is represented explicitly and can be dragged with the mouse.

6.2.5 Mast wizard

In the Professional edition of ProAnt there is a mast wizard function, selectable via the Tools menu, that designs automatically a self-sustaining mast. The mast can be designed either by using the antennas that appear in the headend, or the antennas that appear in the current drawing of the mast. In the first case the headend must be fully described (no component numbered in red). In the mast wizard dialog window the user selects the segments that can be used, the kind of mast (telescopic or not), and the antennas to use (from headend or from drawing). Then ProAnt designs the mast and reports an error if the mast cannot be designed.

When the antennas are taken from the headend, ProAnt places the dishes first in decreasing diameter, and then the antennas in increasing frequency. All divergences are set within 20 degrees. If the divergences are different, it is sufficient to change the divergences after the mast is designed, and reselect mast wizard with antennas from drawing.

7 Printing

With ProAnt it is possible to print the schemas of distribution and headend, the list of materials, the estimate of expenditures, the results of the computations, and a report on the mast. In the Light edition of ProAnt the user simply selects the object to print via the Print menu, selects the printer and presses Ok; in the Professional edition, a more elaborate selection window appears, which is described below.

The print selection window contains a section to select the objects to print, a section to select a cover, and a selection to select the different printing options. The cover is printed based on the data that the user can insert by selecting the menu function File|Project data. The options section contains four folders: one folder for printing the drawings, one for printing the computations, one for the list of materials, and one for the mast.

7.1.1 Drawing Options

In the drawing options it is possible to select distribution and/or headend either on separate sheets or on the same sheet. The orientation can be horizontal, vertical, or optimal. The drawing is adapted to the size of the paper unless the size of a component exceeds the maximum length specified in the graphics options of the View|Options function. Besides each component it is possible to print its number, the code, the attenuation (if it exists), the length (if it is a cable). Only one data can be printed for each component. Priority is given to lengths and attenuation, and then to codes.

7.1.2 Computations options

The user can select what kind of computations to print and select the components whose computations have to be printed.

7.1.3 Components list options

It is possible to print the distributions and headend components either on separate lists or on the same list. The list can also be compressed. In this case the notes of the components are not printed.

7.1.4 Mast options

It is possible to insert notes and describe the regulations that are followed.

7.1.5 Personalizzazione dei fogli di stampa

All printouts can have an underlying watermark consisting of one of two words. The watermark can be set via the graphics folder of the View|Options window.

8 Description of the Menu Bar

We give a short descriptions of all commands available on the menu bar.

File

- **New:** create a new project and eliminate the current project.
- **Open:** open an existing project.
- **Save:** save the current project.
- **Salva con nome:** save the current project with the name specified by the user.
- **Project data:** opens the dialog window to input the project data, which include information about the customer, the building, and the objective of the project. These data are used in the printouts.
- **Exit:** closet the program.

Print

- **Distribution (drawing):** prints the distribution.
- **Headenda (drawing):** prints the headend.
- **Distribution components list:** prints the list of components of the distribution.
- **Headend components list:** prints the list of components of the headend.
- **Drawings and lists:** prints distribution, headend, and lists of components.
- **Calculi:** prints the results of the computations.
- **Selected area:** prints the selected area of the drawing.
- **Mast report:** prints the report about the mast.
- **Estimate:** prints the estimate of expenditures.
- **List of material:** same as estimate but without prices.
- **Selection:** shows the printing options window.

Modify

- **Undo:** undoes up to 50 operations. In the estimate folder undoes the added items.
- **Cut:** copies the selected components in the copy buffer and removes them from the drawing.
- **Copy:** copies the selected components in the copy buffer.
- **Paste:** copies the copy buffer in the selected area.
- **Paste mirror:** copies the mirror image of the copy buffer to the selected area. Attention: not all components can be reflected.

- **Paste rotated:** copy the rotation of the copy buffer to the selected area. Possible rotations are 90, 180 and 270 degrees. Attention: not all components can be rotated.
- **Eliminate:** removes the components from the selected area..

View

- **Zoom in:** increases the visible portion of the drawing.
- **Zoom out:** decreases the visible portion of the drawing.
- **Component bar:** shows or hides the components toolbar. When the bar is not visible it is possible to show it temporarily by holding the shift key.
- **Component tree:** shows or hides the components panel on the left of the screen.
- **Lengths and attenuations:** activates or deactivates viewing of cable lengths and component attenuations.
- **Information:** configures the dynamic test-point.
- **Highlights:** selects what situations to highlight on the drawing grids.
- **Grid sizes:** varies the dimensions of the grids.
- **Options:** shows the Options dialog window of ProAnt.
- **Personalization:** shows the personalization window of ProAnt.

Find

- **Cable not defined:** find a cable that is not defined. Useful for Component selection wizard.
- **Component for calculi not defined:** find a component that is not defined and necessary for the computations.
- **Component not defined:** find a component that is not defined.

Calculi

- **Attenuations to outlets:** computes the attenuations between the headend and all outlets. Also compute the list of best and worst served outlets. The results are shown in the requested distribution calculi folder.
- **Limit signals to components:** computes the minimum and maximum signals required at the input of each component so that the following outlets are served. The results are shown in the requested distribution calculi folder
- **Mutual isolation between outlets:** computes the isolation between all outlets. The results are shown in the requested distribution calculi folder.
- **Channels to components:** computes the channels with signals and noise figures that reach each component. The results are shown in the requested channel calculi folder.
- **Erase calculi:** Erases the results of all requested calculi.

Tools

- **Component selection wizard:** shows the component selection wizard dialog window. It is enabled only when the distribution is passive and all cables are defined.
- **Mast wizard:** shows the mast wizard dialog window.
- **Project wizard:** shows the project wizard dialog window.
- **Library manager:** shows a dialog window that permits to edit the contents of the libraries in an excel style form. By double clicking on any component in the table it is possible to modify the technical data.

Help

- **Info:** shows the info window of ProAnt.

9 Some Useful Suggestions

In this chapter we give some useful suggestions for an optimal use of ProAnt.

9.1 How to design a network quickly

There are some fundamental rules to design a network as quickly as possible, even without using project wizards.

1. Draw only one floor and replicate it using the copy and paste functionalities. Remember to replicate also the cable that connects two floors to avoid drawing it separately.
2. Define a cable with the most common properties and copy the data on all the other cables. Then modify the cables that have different properties using the copying function associated with the ALT key whenever possible. Select View Cable lengths from the menu to check that all cables are of the right length.
3. Use the automatic network design function to choose the other components.

9.2 How to use the network calculi

When you select network calculi ProAnt computes the minimum and maximum signals that can be provided by the headend so that all outlets are served correctly. You can set up the levels of the acceptable signals at the outlets from the Options table. For the computations, ProAnt identifies the best and worst served outlets, and makes sure that the best served outlet gets the highest possible signal while the worst served outlet gets the lowest signal. If you note some red *'s in the results of the calculi, it means that there is no signal that can be used to serve all the outlets. In such case you can compute the limit signals at each component and work backward until you find a red *. That is the first point where you can identify a problem.

9.3 How to create a generator of signals

Sometimes it is convenient to verify what signals reach each outlet by using a signal generator. The same effect can be obtained by drawing a headend consisting of a single antenna that will function as a generator. Then specify your generated signals as channels received by the antenna. You can also create your own library of signal generators.

9.4 Managing projects in different areas

Each town is reached by different signals; thus, if you need to work in different areas, you should change the levels of the channels received by an antenna whenever you work in a different town. To save time, we suggest to create a personal library of

antennas where the levels of the channels are specified already. Then changing town is the same as selecting a different antenna from the library..

9.5 What to do to avoid wasting hours of work

Sometimes computers break, either for hardware problems (hard disk failure, RAM failure, microprocessor overheating, ...), or for software problem (we cannot deny it: we all have experience of the effects of software bugs). However, there are some general rules that limit and usually eliminates damages due to malfunctions.

First of all, save you work often: everything done since the last time you saved may be lost, and not only because of malfunctions, but also because of an electricity failure, or because your son or daughter switches of the computer. ProAnt creates a backup copy with extension .bak every time you save a file. Thus, in case of problems while you save a file you can recover the old file by renaming the file with extension .bak.

It is also a good idea to backup all your files at least once a week and store the backup copies in another building. In this way you protected both from hard disk failures and from other rare events like a fire.

10 Frequently Asked Questions

In this chapter we report the most frequently asked questions from our users. The updated list of questions is on our web site www.proant.com.

Question: When started the program reports the error "You must run the utility GSSADD!". What should I do?

Answer: ProAnt does not recognize the key. If your operating system is Windows NT/2000/XP, then you need to install the parallel port driver by following the instructions reported in Chapter 1. If after performing the operations above the problem is not solved, please contact our technical service.

Question: Sometimes the programs hangs during a printing job and reports an error of key not present. What should I do?

Answer: It is necessary to make sure that your parallel port is configured as SPP or EPP or Bidirectional or Standard. No ECP option should be enabled. Typically this configuration can be done only through the BIOS of your computer. There is no standard procedure to change BIOS configurations, so if you do not know what we are talking about you are advised to seek help from an expert. If after configuring correctly your parallel port the problem persists, check in the Automatic Execution directory (folder) of Windows whether there are any applications that may interfere with the parallel port (driver of a scanner, driver of an Iomega zip device, ...) and try to disable such applications to see which one is causing the problem. We have noted that sometimes the Office toolbar causes problems. Sometimes it is advisable to install a second parallel port, e.g., when your printer requires that your parallel port to be configured in ECP mode. If the problem still persists, please contact our technical service.

Question: When started the program takes a long time to run and the computer slows down considerably. What should I do?

Answer: This problem occurs if Norton Antivirus is active in a Windows NT/2000/XP environment. You should deactivate Norton Antivirus before running ProAnt.

Question: Some pieces of ProAnt do not appear on the screen. What should I do?

Answer: Your screen is configured with an insufficient resolution. ProAnt requires a minimum screen resolution of 800x600. To solve the problem it is sufficient to configure the screen to a higher resolution, provided that your system can handle higher resolutions. Sometimes the screen is configured at 800x600 while the monitor is configured at 640x400. This situation can be recognized by

checking whether the image on the screen scrolls by moving the mouse to the bottom-right corner. If your monitor does not support a minimum resolution of 800x600 (it must be a very old monitor), then you need to replace your monitor.

Question: The text within the ProAnt screens goes over other graphical elements. What should I do?

Answer: You should make sure that Windows is configured with small characters. To solve the problem select small characters in the screen section of the control panel. In Windows 98 you should view the advanced screen settings to change the character properties of the screen.

Question: If I move the key between several computers ProAnt asks for a personalization each time. Why?

Answer: Your licence of ProAnt can be used on a single computer. Each time you move the key to a new computer the key is reinitialized. Since it is typical to use a program on a desktop and on a laptop, you can move freely the key between two computers, without being asked for a personalization each time, provided that you use the same identical personalization on both computers.

Question: I cannot find some components in the library. What should I do?

Answer: When you load the data of a component from a library, ProAnt shows only the codes of those components that are compatible with the symbol of the component you are defining. Often a component is not found because you are using the wrong symbol. A typical example is given by a designer that uses only the four SAT lines of a 5-lines switch. Although you use 4 inputs, the correct symbol for the component is a switch with 5 inputs. If you are using ProAnt version 4 you can find the correct symbol for a component by selecting its code in the panel that appears on the left of the screen in drawing mode. Once the component is selected, the components toolbar is automatically adjusted to the correct graphical symbol. If you are using an earlier version of ProAnt, then you can check whether a code exists in the library by trying an update procedure or by checking the contents of the library via the window to add a line to the estimate of expenditures. Sometimes the component may not be in the library at all. In such case you can input the data of the component and then save them in the library for future use.

Question: How can I update the program and the libraries?

Answer: The updates to the program and the libraries are available from our internet site www.proant.com. To download the libraries it is sufficient to click on the item Download Libraries of the version of ProAnt that you have and select a

directory (folder) of your hard disk where to save the downloaded file. The libraries are in compressed format and you need the program WinZip to extract them. The program WinZip can be downloaded from www.winzip.com. To extract the libraries, open with WinZip the file that you have downloaded from our site, select as destination directory (folder) the directory where you store the libraries (usually C:\Programs\Zanetti F.lli s.n.c.\ProAnt 4.0\Libraries), and select the command Extract. To update the program, download the related zip file in the same way as described above, expand the file into a temporary directory (folder) using WinZip, and run the program Setup.exe. To check whether you need to update your software compare the version of the software on our site with the version number that appears in the info window of ProAnt.