


PROLITE-67

FTTH TESTER & SELECTIVE OPTICAL POWER METER



SAFETY NOTES

Read the user's manual before using the equipment, mainly "SAFETY RULES" paragraph.

The symbol  on the equipment means "SEE USER'S MANUAL". In this manual may also appear as a Caution or Warning symbol.

Warning and Caution statements may appear in this manual to avoid injury hazard or damage to this product or other property.

USER'S MANUAL VERSION

Version	Date
1.0	September 2016

SAFETY RULES

- * **Safety can not be assured if instructions are not closely followed.**
- * The external DC charger is a **Class I** equipment, for safety reasons plug it to a supply line with the corresponding **ground terminal**.
- * Use the mains adapter in **Overvoltage Category I** and **Pollution Degree 1** installations. To use **INDOOR**.
- * When using some of the following accessories **use only the specified ones** to ensure safety:
 - Rechargeable battery.
 - Mains adapter.
 - Power cord.
- * Observe all **specified ratings** both of supply and measurement.
- * Use this instrument under the **specified environmental conditions**.
- * **The user is not allowed** to carry out the following maintenance operations:
 - Any change on the equipment must be carried out exclusively by technical staff.
- * Follow the **cleaning instructions** described in the Maintenance paragraph.















CAUTION



The battery used can present danger of fire or chemical burn if it is severely mistreat.

Do not disassembly, cremate or heat the battery above 100 °C under no circumstances.

* Symbols related with safety:

	DIRECT CURRENT		ON (Supply)
	ALTERNATING CURRENT		OFF (Supply)
	DIRECT AND ALTERNATING		DOUBLE INSULATION (Class II protection)
	GROUND TERMINAL		CAUTION (Risk of electric shock)
	PROTECTIVE CONDUCTOR		CAUTION REFER TO MANUAL
	FRAME TERMINAL		FUSE
	EQUIPOTENTIALITY		EQUIPMENT OR COMPONENT TO BE RECYCLED

Specific Prescriptions

- * Use the **FAULT LOCATOR** output with caution (See description on the "Description of controls" chapter).
- * Keep closed the cover of this output when not using it.
- * The **FAULT LOCATOR** output emits visible laser light at 650 nm wavelength and 0 dBm power in a divergence beam of 0.15 rad.
- * Bear in mind warning messages next to the output laser:



- * Do not manipulate inside the instrument, it could cause a dangerous laser radiation.

Descriptive Examples of Over-Voltage Categories

- Cat I** Low voltage installations isolated from the mains.
- Cat II** Portable domestic installations.
- Cat III** Fixed domestic installations.
- Cat IV** Industrial installations.

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*FTTH TESTER & SELECTIVE OPTICAL POWER METER **PROLITE-67***

1 GENERAL

1.1 Description

The **PROLITE-67** is an instrument that can measure simultaneously and in a selective way the three wavelengths used in optical fiber. It has a selective receiver with a filter for each band that makes a real and very stable measurement of each wavelength. With this feature you will be able to certify any facility according to the infrastructure policy.

The **PROLITE-67** is able to work in any optical fiber system, but it is optimised for systems based on **GPON** networks that use technologies **FTTx / PON**, which provide speeds over 1 Gbps.

In the design of the **PROLITE-67**, it was paid special attention to create a practical and accurate instrument and, at the same time, easy to use. Once inside a function of the instrument, it is very easy to modify any parameter.

In addition to make common measurements in optical fiber installations, the **PROLITE-67** measures wavelengths on active networks such as **RFoG** and **xPON**. Results will be displayed just plugging the fibre cable from the distribution centre to the **OLT** input connector and the fibre cable from the user to the **ONT** input connector. Then, pressing a key you will see the results on the screen. When the **PROLITE 67** is taken measures it acts as a pass-through instrument and extracts a small percentage of the signal to measure, so the optic fibre service is not interrupted.

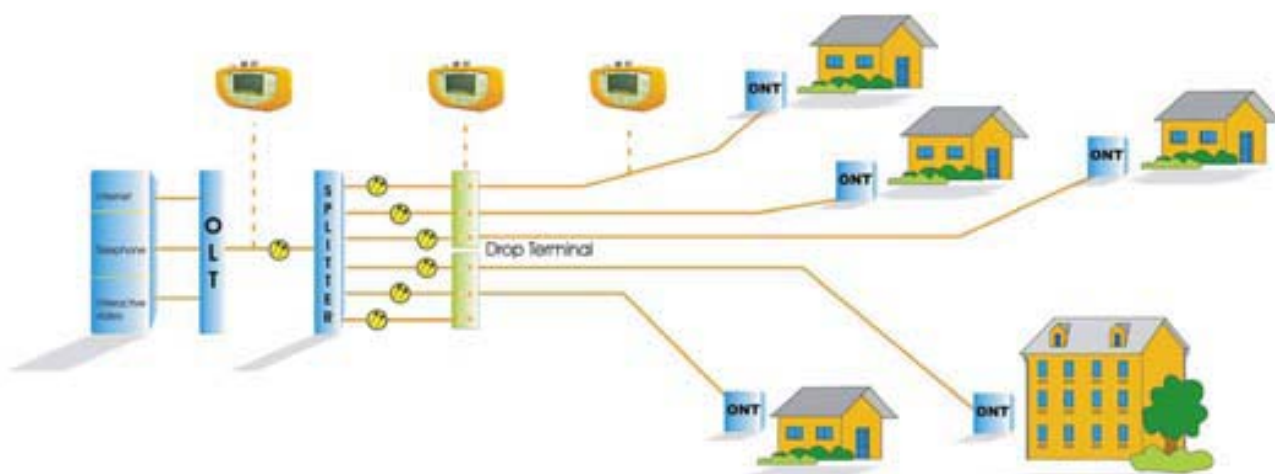


Figure 1.



The instrument has an **USB** output connector to connect it to a computer. In this way you can obtain reports or update firmware.

The **PROLITE-67** is a multipurpose tool with multiple useful functions, for new facilities or for testing, analysis or maintaining an existing one.

The functions **ATTENUATION TEST** and **OPTICAL LOSS TEST SET**, working with a triple source laser (PROLITE-105), performs individualized measurements for the three wavelengths used in fibre (1490, 1550 nm for Downstream and 1310 nm for Upstream) and displays them simultaneously on screen. It can define and store different threshold values.

The **LOSSES** function allows measuring insertion losses, defining a reference value.

By the **VISUAL FAULT LOCATOR** module you can generate a visible laser beam, and allows you to change it in the form of continuous laser beam or pulses. Connecting the laser output to the cable to check, you can find cuts or breaks, identify fibres, etc.

LOGGER function stores up to 500 measurements per function. In each data acquisition is stored each wavelength measure and its related data. It can be reviewed later or, transferred to a PC.

The design of the **PROLITE-67** is adapted for fieldwork: is compact and resistant to adverse conditions. Backlight LCD and contrast control provides an excellent visibility for reading. An ergonomic plastic case, perfectly adapted, protects the instrument from hitting or accidental falling and facilitates holding it. The Li-Ion battery is rechargeable and it has a long operation time.

In conclusion, the **PROLITE-67** is the ideal tool for any installation of optic fibre, because is ergonomically designed, robust, easy to use and economical. It has all the functions needed to make an installation and onward maintenance.




2 INSTALLATION

2.1 Power Supply

The **PROLITE-67** is a portable instrument powered by a rechargeable Li-Ion battery. The instrument comes with a mains adapter which enables the **PROLITE-67** to be plugged to the mains for operation and battery charging.

2.1.1 Operation Using the Mains Adapter


Connect the mains adapter to the **PROLITE-67** through the external power connector placed at the right side of the instrument. Then, connect the adapter to the mains to start up battery charging. Next, press the **ON/OFF**  key. Then the instrument starts working.

CAUTION



Before using the mains adapter make sure that it is the appropriate one for your mains voltage.

2.1.2 Operation Using the Battery

Press the key **ON/OFF**  to start the instrument powered by the battery. When the battery is full loaded, the **PROLITE-67** has an autonomy aprox. of 10 hours of continuous work.

When the battery is flat, the instrument will not start up or, if working, will switch off.

2.1.3 Battery Charging

First switch off the **PROLITE-67** in order to charge the battery. Then connect the power input to the mains adapter. Now connect the adapter to the mains. Charging time depends on the state of the battery. If the battery is flat, the battery charging time is 3 hours aprox.



2.1.4 Recommendations using the battery

If anticipating a long period of inactivity for your instrument, it is advisable to store it with the battery fully charged and at temperatures below 25 °C.

It is also advisable in these cases to carry out a cycle of charging/discharging and a subsequent half charge (i.e. 50 %) every 3 months.



3 OPERATING INSTRUCTIONS

3.1 Descriptions of Controls and Elements

Front Panel

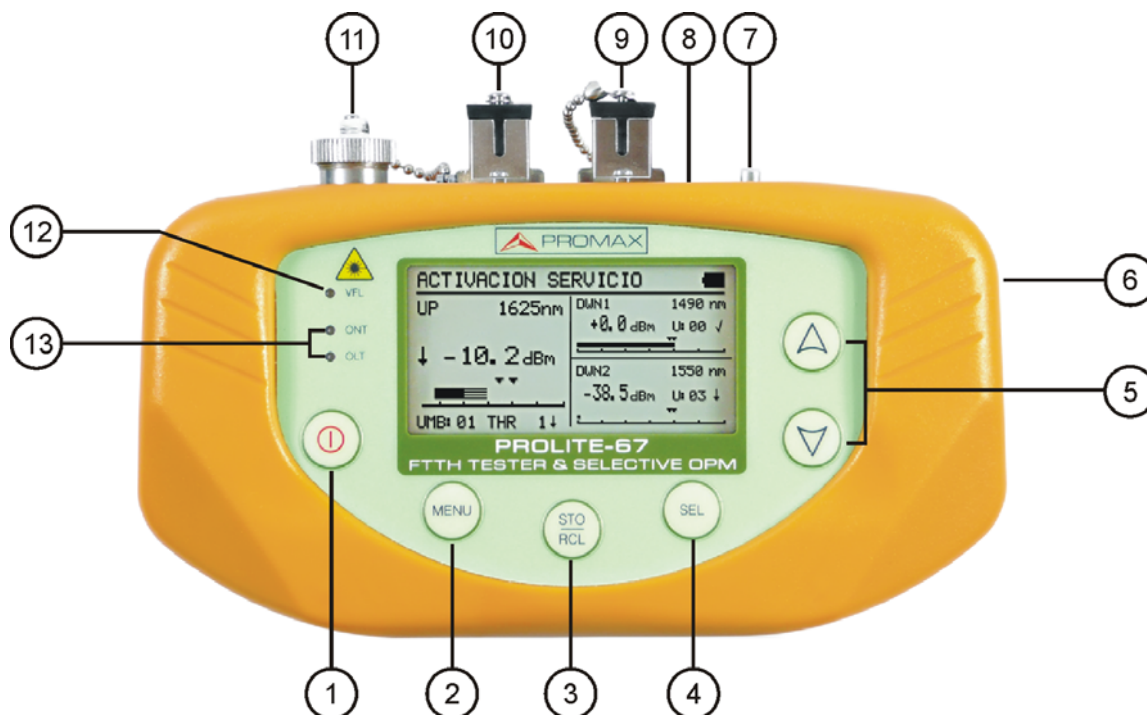


Figure 2.- Front View.

- 1 **ON / OFF** Button.
- 2 Main Menu Access Button.
- 3 Storage Data Button (**STO**) / Recall Data Button (**RCL**).
- 4 This button has several functions depending what screen you are:

Menu Screen:	It gets into the selected option.
Function Screen:	It moves between editable fields.
Configuration Screen:	It goes to editable field.
- 5 These buttons have several functions depending on the screen:

Menu Screen:	It moves between the menu options.
Function Screen:	It shows the available values for the selected option. It also allows capturing the current value as a reference value by pressing both buttons simultaneously.
- 6 External 12 V DC Power Input.
- 7 Anchor point for wrist strap.



- 8 **Mini-USB** female connector.
- 9 **SC-APC** Connector (Female) for Optical Power Meter (**OPM**) and **OLT** signal.
- 10 **SC-APC** Connector (Female) for **ONT** input signal.
- 11 Universal Adaptor (2.5 mm) for Laser (650 nm) Output.

WARNING


Visible laser light (650 nm). Not stare into beam. Laser class 2.

- 12 Laser Status **LED** to use at the **VISUAL FAULT LOCATOR** function:
 - LED OFF:** Laser stopped.
 - LED RED:** Laser working.
 - BLINKING:** Laser working on pulses.
- 13 **LEDs** Status for **ONT** (Upstream) and **OLT** (Downstream):
 - COLOURS:**
 - GREEN** (value within thresholds).
 - RED** (value below threshold).
 - ORANGE** (value above threshold).



3.2 Operating Instructions

Main functions of the **PROLITE-67** are accesible through the main menu, which you can access at by pressing the button  :

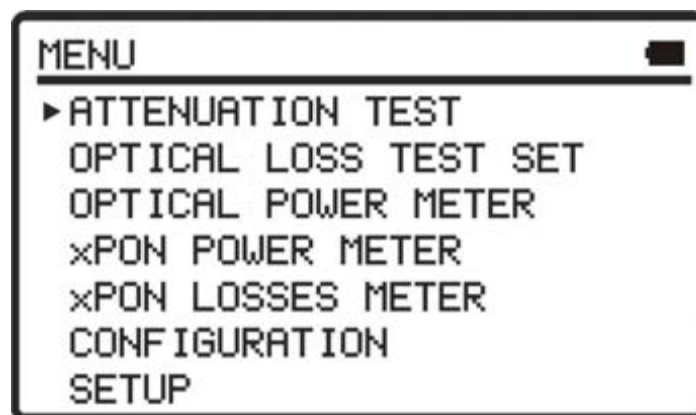


Figure 3.- MENU screen.

ATTENUATION TEST:

This option measures simultaneosuly and selectively losses for the three wavelenghts trasmitted by a generator (**PROLITE-105**) installed at the end of the fibre in order to certify the installation.

OPTICAL LOSS TEST SET:

This option, besides measuring as in the previous option, it measures also the optical power and displays its status relating to an editable threshold value.

OPTICAL POWER METER:

This option measures optical power at the **OPM** input (**OLT**) in the whole band and allows you to take a reference value to measure from it. It also detects lowfrequency modulation in test signals.

xPON POWER METER:

This option measures the optical power from both signals coming from **OLT** (Downstream) and the power coming from **ONT** (Upstream), allowing communication between them.

xPON LOSSES METER:

This option measures losses for **OLT** and **ONT** signals at anywhere on the network.





CONFIGURATION:

This option gives access to the visual fault locator, threshold edition and threshold value to certify an installation.

SETUP:

This option allows you to configure some parameters such as language, time, data, contrast, etc.







To access any of these menus, press the button **MENU**  to access the main menu and then press **UP**  or **DOWN**  until your option is selected. Now press **SEL** .

3.2.1 **SETUP Mode**

This menu allows you to edit some basic parameters such as time, hour and language among others.

To access the **SETUP** menú:

- 1 Press the button **MENU** .
- 2 Press  or  until pointing at **SETUP**.
- 3 Press **SEL**  to get into the **SETUP** menu.

It shows a screen with parameters to configurate the system (Fig. 4).

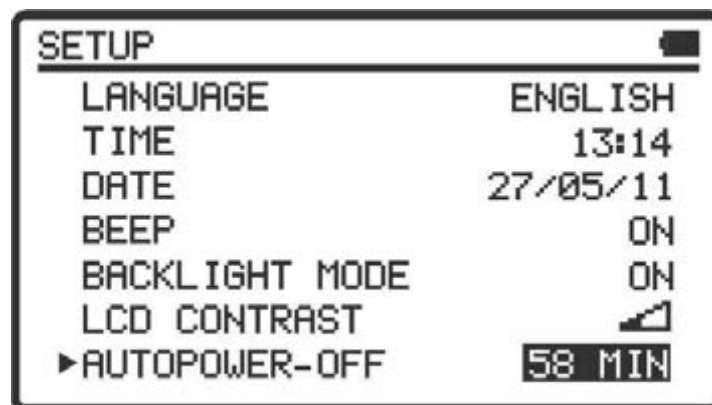










Figure 4.- **SETUP** Screen.

To edit the status or change a parameter value:



- 1 Press  or  to move along the menu.
- 2 Place the arrow pointing at the parameter to modify and press **SEL** .
- 3 The arrow moves next to the parameter value. Now you can change it using  or . When editing date and time, press **SEL**  to move to the next field.
- 4 Once edited, press again **SEL**  to get out of the parameter edition.



- 5 Press **MENU**  to get out from the **SETUP** menu and back to the main menu.

Parameters you can edit are:



a) **LANGUAGE**

It is the language used on screen and menus. Press  or  to move among the available languages (Spanish, English and German).

b) **TIME**

It indicates current time. Press  or  to enter hour and minutes.

c) **DATE**

It indicates current data in European format (dd-mm-yy). Press  or  to enter day, month and year.

d) **BEEP**

This parameter enables (**YES**) or disables (**NO**) the beep. When it is enabled is sounds a beep when pressing any button.

e) **BACKLIGHT MODE**

This parameter allows you to enable (**YES**) or disable (**NO**) the backlight. When **AUTO** option is active, the backlight turns off automatically after 1 minut without pressing any key.

f) **LCD CONTRAST**

This parameter allows you to change the screen contrast.

g) **AUTO-POWER OFF**





This parameter lets you define a time for the instrument automatic shutdown. After this time without pressing any key, the instrument automatically turns off. This time can range from 1 to 60 minutes. To disable this option select OFF.



3.2.2 CONFIGURATION Function

Through this function you can access other available options such as the visual fault locator, threshold configuration and network type.

To access this function:

- 1 Press **MENU** .
- 2 Press  ó  until pointing at **CONFIGURATION**.
- 3 Press **SEL**  to get into this function (see figure below).

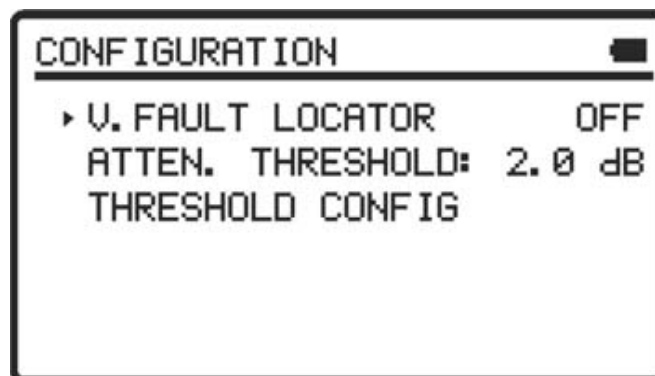









Figure 5.- CONFIGURATION screen.

To change a parameter or get into a sub-menu:

- 1 Press   to move along the menu.
- 2 Place the arrow pointing at the option or parameter to select or modify and press **SEL** .
- 3 The parameter changes to shaded or it gets into the menu. Now you can change it pressing  or .
- 4 Once changes are made, press again **SEL**  to get out from the parameter edition.
- 5 To get out from the configuration mode and back to the main menu press **MENU** .



On the configuration screen are three available options.

- a) **Visual Fault Locator**
Through the **VISUAL FAULT LOCATOR** it emits a visible laser light. For more details see section 3.2.9.
- b) **Threshold Configuration**
It allows you to define up to ten pairs of threshold values.

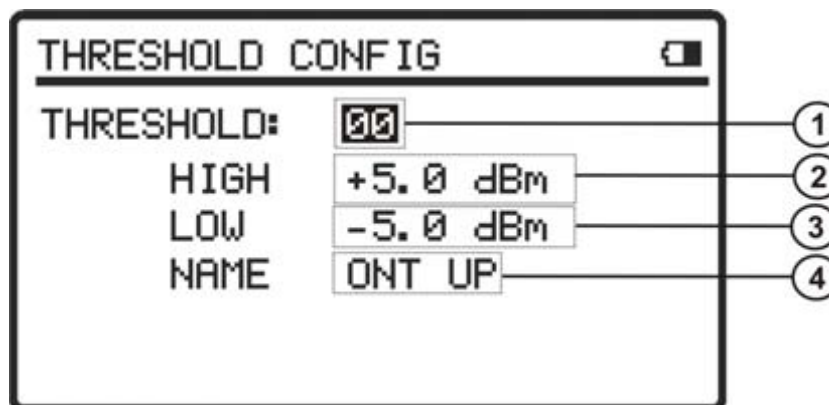





Figure 6.- THRESHOLD CONFIGURATION screen.

Next are described each one of the fields on screen:

- 1 Number assigned to the group of threshold values.
- 2 Upper value threshold.
- 3 Lower value threshold.
- 4 Name assigned to the group of threshold values.

To modify the threshold values:

- 1 Press **SEL**  to move along the parameters.
- 2 To change a parameter, it must be shaded. Once it is shaded it can be modified by using the arrows.
- 3 Once changes are made, press again **SEL**  to get out from editing the parameter.
- 4 To get out from the configuration mode and back to the main menu press **MENU** .

- c) **Attenuation threshold**





This parameter allows you to define a value as a threshold in order to validate a telecommunications facility.



3.2.3 ATTENUATION TEST Function

This function measures simultaneously and selectively the signals emitted by a test source (**PROLITE-105**) in three wavelengths thanks to the selective filters existing on each band. These data are essential to certificate a fibre optic installation. The program supplied with the instrument generates a certificate from the data recorded.

To access this function:

- 1 Press **MENU** .
- 2 Press  or  until pointing at **ATTENUATION TEST**.
- 3 Press **SEL**  to get into this function (see figure 7).

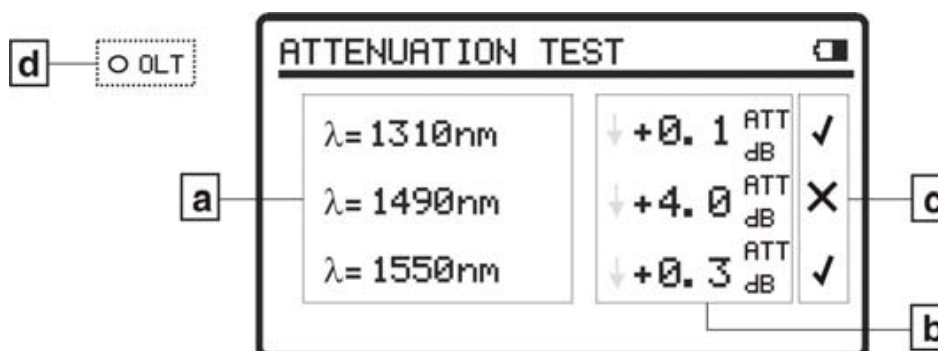




Figure 7.- ATTENUATION TEST Screen.

To make a proper measurement with this function, first you have to capture the reference values. To do this you should use the **PROLITE-67** with a calibrated wavelength generator (**PROLITE-105**) working in simultaneous mode with these 3 wavelengths working at the same time through a reference optical fibre. Then you have to capture the new reference values pressing **UP**  and **DOWN**  simultaneously for one second. Now you can make measurements on the optical fibre at the installation. For a practical application refer to the appendix.

- a) Wavelength at which measurements are taken.
- b) Absolute power loss of the signal at the corresponding wavelength. It represents the measurement of the power loss or signal attenuation in dB.
- c) Status of the signal with respect to attenuation threshold level, whose value is defined in the menu "**Setup**". If you see the sign "X" it means that the signal exceeds the threshold level. If you see the sign "✓" it means that the signal does not exceed the threshold level.



- d) The **OLT** led indicates the status of the **OLT** signal with respect to the **ATTEN. THRESHOLD** value defined in the Configuration Menu. Three indicator light colours are possible and each colour represents its status signal with respect to this attenuation threshold value. They are **GREEN** (when all signals are below the attenuation threshold value), **AMBER** (when some signal are above the attenuation threshold value) and **RED** (when all signals are above the attenuation threshold value).

To capture all reference values, press and simultaneously. Then, the three reference values will be captured simultaneously at three wavelengths.

To make or consult a data register, refer to the section **LOGGER Function**.

3.2.4 OPTICAL LOSS TEST SET Function

This function measures signals in a simultaneous and selective way at three wavelengths through selective filters for each band emitted by a test source (e.g. **PROLITE-105**). It is equivalent to the previous one but it has more options such as absolute measures and measurement with respect to the threshold value. Reference values can be taken individually for each wavelength.

To access this function:

- 1 Press **MENU** .
- 2 Press or until pointing at **OPTICAL LOSS TEST SET**.
- 3 Press **SEL** to get into this function (see figure below).

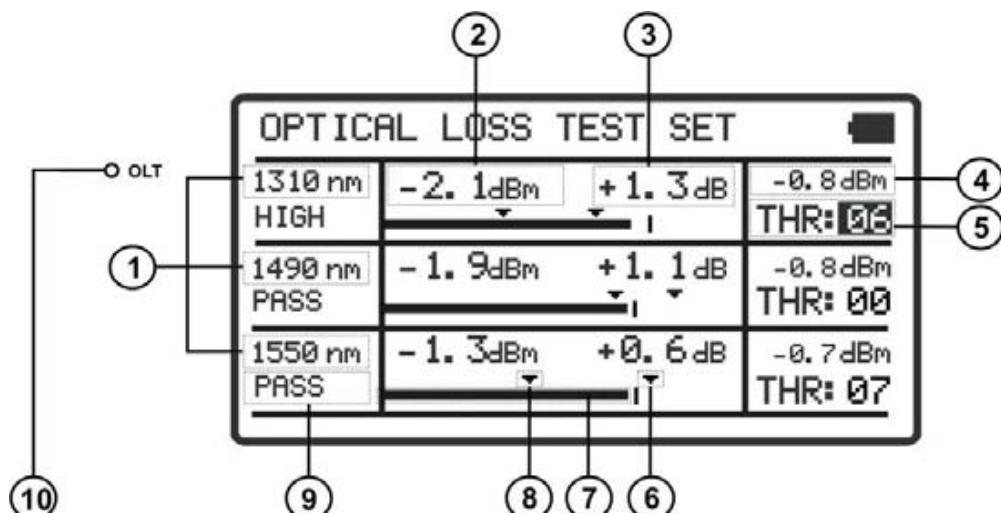


Figure 8.- OPTICAL LOSS TEST SET Screen.




The display is divided into three equal rows. Each row shows measurements for each wavelength. Next are described each one of the fields on screen:



- 1 Wavelength at which it is measuring.
- 2 Absolute optical power of the signal at the corresponding wavelength. Absolute measurement mode is the absolute power of signal in dBm (dB referred to 1 mW).
- 3 Absolute signal losses (Attenuation) at the corresponding wavelength. It represents the losses power of the signal in dB.

$$AT \text{ (dB)} = P_{\text{reference}} \text{ (dB)} - P_{\text{measured}} \text{ (dB)}$$

- 4 Relative losses of the signal with respect to the reference value. Reference value can be changed by capturing a new one.
- 5 Group of threshold values selected. Threshold values can be grouped and saved on the memory of the instrument and later to select the one that best meets the criterion of quality to follow.
- 6 Upper threshold value.
- 7 Power graphical representation.
- 8 Lower threshold value.
- 9 Signal status with respect to threshold values. Three status are possible: PASS, HIGH, LOW.
- 10 The **OLT** led indicates the status of the **OLT** signal with respect to the threshold values. Three indicator lights colours are possible and each colour represents status signal with respect to threshold values: **GREEN** (PASS), **AMBER** (HIGH) and **RED** (LOW).

To navigate through the editable fields on the screen press **SEL** . The selected field changes to shaded.

To edit a threshold group of values, select it and press  or .

To capture a new reference value, select the current reference value and press both keys  and  simultaneously.

To make or consult a logger refer to the section **LOGGER Function**.







3.2.5 OPTICAL POWER METER Function (OPM)

This function measures independently the power for each wavelength by the action of the selective filters that only let pass the signal corresponding to the selected wavelength.

Under the situation of laboratory, **LANs**, **WANs** and **CATV** as well as longdistance optical network, the Optical Power Meters, together with PROMAX stabilized laser sources, can be used to identify optic fibre, measure optical attenuation, verify continuity and evaluate fibre link transmission quality.

To access this function:

- 1 Press **MENU** .
- 2 Press  or  until pointing at **OPTICAL POWER METER**.
- 3 Press **SEL**  to get into this function (see figure below).

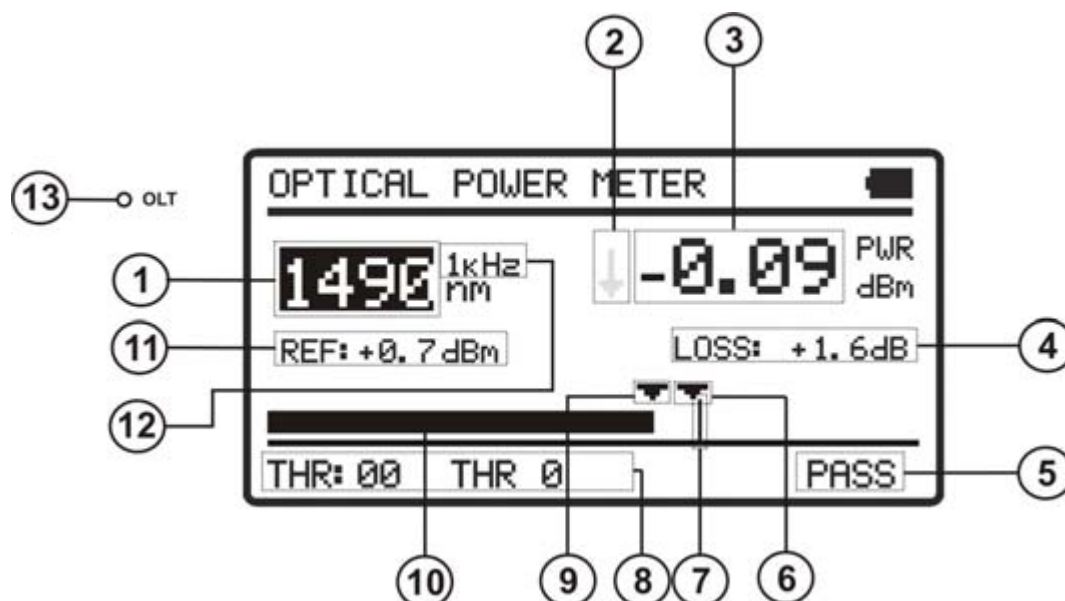


Figure 9.- OPTICAL POWER METER.

Next are described each one of the fields on screen:



- 1 Wavelength at which it is measuring. Available wavelength are 1310, 1490, 1550 and 1610 nm.
- 2 It is an arrow which indicates if the value exceeds (arrow pointing up) or does not arrive (arrow pointing down) to the minimum levels in order to be graphically represented.





- 3 Absolute optical signal power at the selected wavelength. Absolute measurement mode represents the absolute signal power value in dBm (dB referred to 1 mW). Power measure is right only when the measured input signal power is at the same wavelength as selected in the instrument.
- 4 Relative signal losses (attenuation) at the selected wavelength. It is in dB. It is equal to:

$$\text{ATTEN} = \text{Ref (dBm)} - \text{POT (dBm)}$$
- 5 Signal status with respect to threshold values. Three status are possible: LOW, PASS, HIGH.
- 6 Valor umbral superior.
- 7 Maximal power value recommended for the selected wavelength.
- 8 Selected threshold group of values. Threshold values are grouped and saved on the memory of the instrument, then later they can be selected in order to the quality criterium to meet.
- 9 Upper threshold value.
- 10 Graphical representation of the power.
- 11 Reference value from which is calculated the relative losses. Reference value can be changed.
- 12 Modulation Identification.
- 13 The **OLT** led indicates the status of the **OLT** signal with respect to the **ATTEN. THRESHOLD** value defined in the Configuration Menu. Three indicator light colours are possible and each colour represents status signal with respect to this attenuation threshold value. They are **GREEN** (when all signals are below the attenuation threshold value), **AMBER** (when some signal are above the attenuation threshold value) and **RED** (when all signals are above the attenuation threshold value).

To navigate through the editable fields on the screen press **SEL** . The selected field changes to shaded.

To edit the wavelength or the threshold group, select it and press  or .

To capture a new reference value, select the current reference value and press both keys  and  simultaneously.

To make or consult a logger refer to the section **LOGGER Function**.







3.2.6 xPON POWER METER Function

This function makes optical measurement on active **RFoG** and **xPON** networks. In the **PROLITE-67** are integrated selective filters needed to measure the optical power at wavelengths used in networks **RFoG** and **xPON**. Thanks to these selective filters the instrument identifies automatically each wavelength, recognizing the calibration parameters for each signal. This also prevents confusing between input **ONT** and **OLT**.

The burst detector measures the optical power of every burst sent by the **ONT** at 1310 nm (**xPON**). The Downstream channel measures selectively the average optical power of the signal sent by the **OLT** at wavelengths 1490 nm and 1550 nm. When measuring, the service is not interrupted, since it uses the "pass-through" method that is the only proper way to measure the upward flow, as on the **GPON** networks it can only transmit at the request of the **OLT**.

In **PROLITE-67** selective filters required are integrated to measure optical power at the wavelengths used in the **xPON** and **RFoG** networks. Thanks to these selective filters it can automatically identifies each wavelength, recognizing the calibration parameters of each signal.

To access this function:

- 1 Press **MENU** .
- 2 Press  or  until pointing at **xPON POWER METER**.
- 3 Press **SEL**  to get into this function (see figure below).

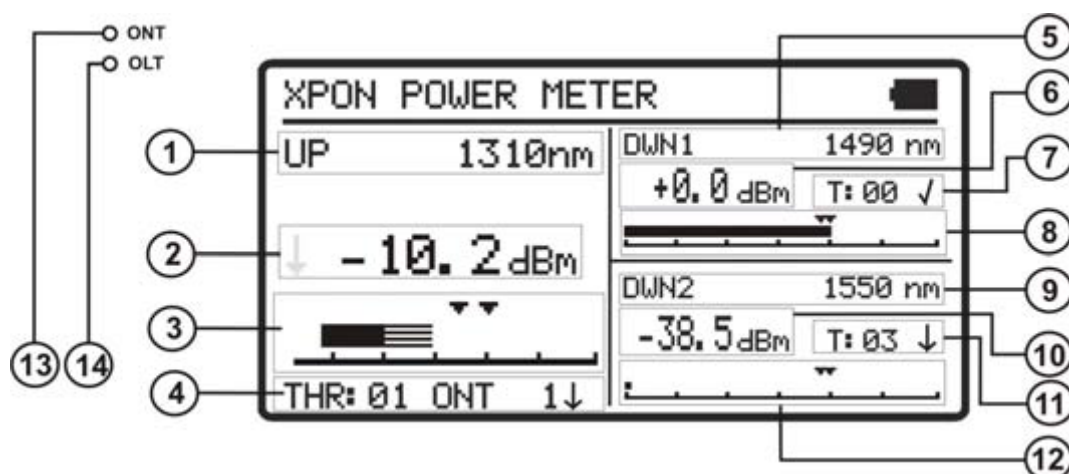


Figure 10.- xPON POWER METER screen.



Next it is described each of the fields on the screen:

Upstream signal (1310 nm / 1610 nm)

- 1 Upstream Wavelength signal. Selectable by the user. For **GPON** networks is 1310 nm. For **RFoG** networks is 1610 nm.
- 2 Absolute optical power of the signal at the corresponding wavelength. Absolute measurement mode is the absolute power of signal in dBm (dB referred to 1mW).
- 3 Graphical representation of the Upstream power. Arrows indicate the upper and lower threshold values corresponding to the threshold group selected. The solid bar indicates the average power. The dashed bar indicates the the peak value on bursts.
- 4 Threshold selected group (code and name identification). The sign next to the threshold group indicates if the power value is within (✓), higher (⬆) or lower (⬇) respect to the threshold group.

Downstream Signal 1 (1490 nm)

- 5 Downstream Wavelength signal.
- 6 Absolute Optical power for the Downstream signal. Absolute Measurement mode represents the absolute value of the signal power in dBm (dB referred to 1 mW).
- 7 Group selected threshold (identification code). The sign next to the code indicating whether the power value is within (✓), is higher (⬆) or below (⬇) about the group threshold.
- 8 Graphical representation of the power of the Downstream. The arrows indicate the upper and lower threshold values in the group threshold.


Downstream Signal 2 (1550 nm)



- 9 Downstream Wavelength signal.
- 10 Absolute Optical power for the Downstream signal. Absolute Measurement mode represents the absolute value of the signal power in dBm (dB referred to 1 mW).
- 11 Graphical representation of the power of the Downstream. The arrows indicate the upper and lower threshold values in the group threshold.
- 12 Group selected threshold (identification code). The sign next to the code indicating whether the power value is within (✓), is higher (⬆) or below (⬇) about the group threshold.



LEDs

- 13 The **ONT** led indicates the status of the **ONT** signal with respect to the threshold values. Three indicator lights colours are possible and each colour represents status signal with respect to threshold values: **GREEN** (PASS), **AMBER** (HIGH) and **RED** (LOW).
- 14 The **OLT** led indicates the status of the **OLT** signal with respect to the threshold values. Three indicator lights colours are possible and each colour represents status signal with respect to threshold values: **GREEN** (PASS), **AMBER** (HIGH) and **RED** (LOW).

To navigate through the editable fields on the screen press **SEL** . The selected field changes to shaded.





To edit a wavelenght or a threshold group of values, select it and press  or .

To make or consult a logger refer to the section **LOGGER Function**.

3.2.7 xPON LOSSES METER Function

The insertion loss is defined as the ratio between the received power respect to the transmitted total power. Power loss signal is due to the different components that are in the transmission line of the optical fibre and the attenuation that they produce. These components are connectors, splitters, couplers, etc...

To access this function:

- 1 Press **MENU** .
- 2 Press  or  until pointing at **xPON LOSSES METER**.
- 3 Press **SEL**  to get into this function (see figure below).

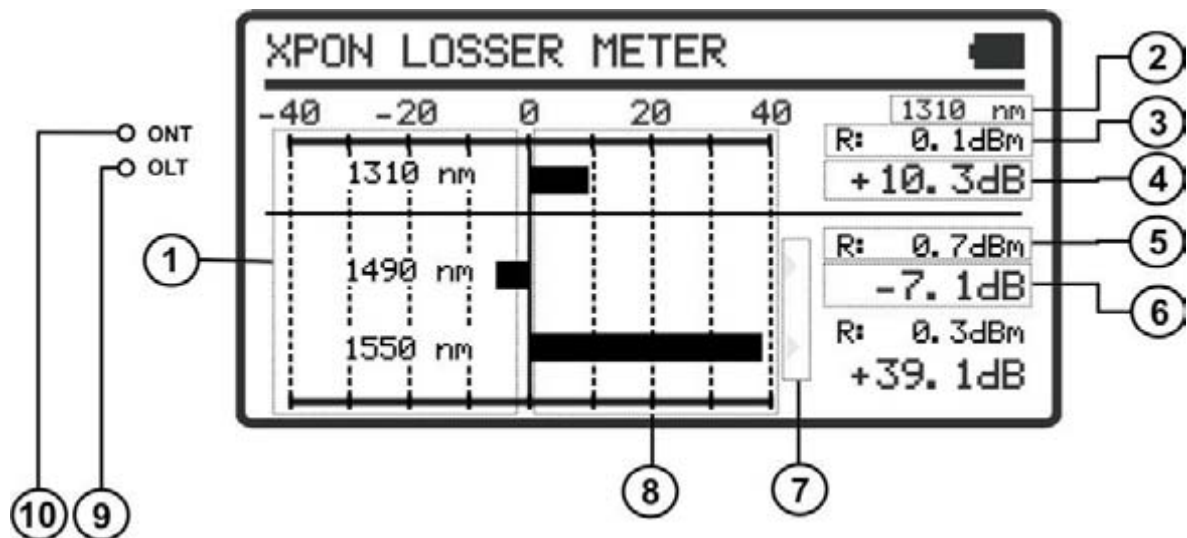


Figure 11.- xPON LOSSES METER screen.

The screen shows power gain or losses in dB for each wavelength in a graphical and numerical way.

The central point «0» at the graph represents the reference level captured. From this point the power signal grows or decreases with respect to this reference point. For a signal going to the **OLT** (Downstream: 1490/1550) the losses grow and a signal going to the **ONT** (Upstream: 1310/1610) losses decrease.

Bar graph represents losses/gains of ± 40 dB with respect to the reference value. Graph shows an arrow when it exceeds this value in an end. But it will show the real value in numeric format.


Next are described each one of these fields on the screen:

- ① Row with all measures corresponding to each wavelength.
- ② Upstream Wavelength signal. Selectable by the user. For **GPON** networks is 1310 nm. For **RFoG** networks is 1610 nm.
- ③ Reference value from which is calculated the relative losses of the signal. Reference value is captured.
- ④ Relative losses for the Upstream signal.
- ⑤ Reference value from which is calculated the relative losses of the signal. Reference value is captured.
- ⑥ Relative power losses for the Downstream signal.
- ⑦ This arrow indicates that the value is bigger than the scale on the graph.
- ⑧ Graphical representation of the power losses signals.





LEDs

- 9 The **ONT** led indicates the status of the **ONT** signal with respect to the attenuation threshold value. Three indicator lights colours are possible and each colour represents status signal with respect to threshold values: **GREEN** (PASS), **AMBER** (HIGH) and **RED** (LOW).
- 10 The **OLT** led indicates the status of the **OLT** signal with respect to the attenuation threshold value. Three indicator lights colours are possible and each colour represents status signal with respect to threshold values: **GREEN** (PASS), **AMBER** (HIGH) and **RED** (LOW).

To navigate through the editable fields on the screen press **SEL** . The selected field changes to shaded.

To change a wavelength, select it and press  or .

To capture a new reference value, select the current reference value and press both keys  and  simultaneously.

To make or consult a logger refer to the section **LOGGER Function**.

3.2.8 **LOGGER Function**

LOGGER function takes data and save them on the memory, so they can be viewed or downloaded on a computer. Each function has its own logger memory up to 500 loggers par function.

How to edit or store a **LOGGER**:


- 1 From the function you are press **STO / RCL**  to enter in the Storage and Recall mode.
- 2 The upper line on the screen changes to a line that shows a logger index. If a logger memory has been used it appears the logger's name and date and time the data was taken. If the logger has not been used yet, it appears the logger's name (by default) with no time neither date (see figure below).



Figure 12.






- 3 To scroll through the logger's index press the arrow keys  or .
- 4 To edit or make a logger press again **STO / RCL** .
- 5 Then on screen appears several options to make a logger (see figure below).






Figure 13.- New logger.


In case you are trying to store a logger on a previous logger it will appear a message warning about over-writing (see figure below).



Figure 14.- Over-writing logger.



- 6 To continue, select one option using the cursor keys  or  and press **SEL**  on a option:

- OK** It makes the logger.
- CANCEL** It cancels the logger.
- ONLY NAME** It appears a virtual keyboard that allows you to change the logger's name. Use the cursor keys to move through the keyboard and the **SEL**  key to select the letter (see figure below).

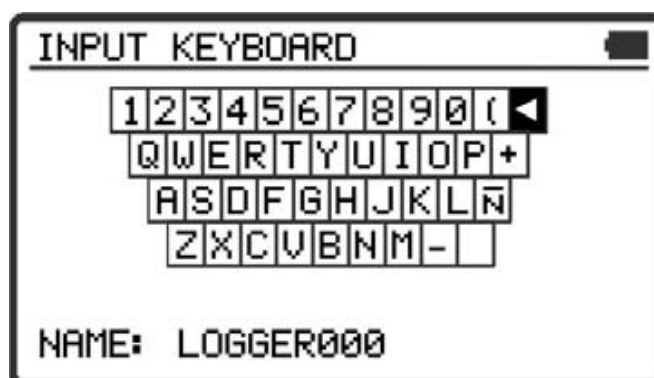










Figure 15.- Virtual keyboard.

- 7 When making the logger the message "**Saving list**" appears on screen then the logger is stored with current date and time.

How to consult a **LOGGER**:

- 1 From the function you are, press **STO / RCL**  to enter in the Storage and Recall mode.
- 2 Scroll through the logger's index pressing the arrow keys  or .
- 3 When you are on the logger you want to see, press the key  to access the logger. Then it appears a screen with all data. From this data screen you can move forward or backward by pressing the cursor keys  or . If the logger is empty it appears the message "**No data**".
- 4 To return to the function press **STO / RCL**  or .



Now you have some logger examples for each one of the functions:

LOGGER000 08: 15: 18 31/03/11			
1310 nm	A:	-1.0 dB	✓
1490 nm	A:	-1.0 dB	✓
1550 nm	A:	-1.0 dB	✓
ATTEN. THRESHOLD		2.0 dB	

Figure 16.- ATTENUATION TEST Logger.

LOGGER000 08: 20: 18 31/03/11		
1310 nm	1490 nm	1550 nm
-15.6 dBm	-0.8 dBm	+0.1 dBm
+16.4 dB	+1.5 dB	+0.0 dB
-10.0/ 5.0	-1.3/ 0.0	-1.0/ 0.0
LOW	PASS	UP

Figure 17.- OPTICAL LOSS TEST SET Logger.

LOGGER000 08: 22: 59 31/03/11	
1490 nm	
PWR:	-1.00 dBm
LOSS:	-1.70 dB
THRESHOLD:	-1.30/ +0.0 dBm
MOD:	1 kHz

Figure 18.- OPTICAL POWER METER Logger.



LOGGER000 08:31:59 31/03/11		
UP	DWN	
1310 nm	1490 nm	1550 nm
+1.3 dBm	↓-50.0 dBm	↓-50.0 dBm
5.0/-5.0	0.0/-20.0	-15.0/-25.0
PASS	LOW	LOW

Figure 19.- xPON POWER METER Logger.

LOGGER000 08:31:59 31/03/11		
<u>UPSTREAM</u>		
LOSS:	↓+32.0 dB	1310 nm
<u>DOWNSTREAM</u>		
LOSS:	↓+50.0 dB	1490 nm
LOSS:	↓+50.0 dB	1550 nm

Figure 20.- xPON LOSSES METER Logger.

3.2.9 Visual Fault Locator

The module **VISUAL FAULT LOCATOR** emits a visible laser light at 650 nm. If you connect the output laser to the installation you want to verify, you will find cuts, breakings, identify fibres, etc.

This function has these options:

- OFF:** Disables laser.
- ON:** Enables laser.
- PULSED:** Laser enabled in pulsed mode.

You can buy an adapter for fibre with ferrule 1.25 mm as an optional accessory.



3.3 Connecting to a computer

This instrument allows you to be connected to a personal computer via **USB** in order to download registers and to update firmware.

For more information see next chapter about **PROLITE-67** control software.



4 CONTROL SOFTWARE PL-67

4.1 Description

This software is an application that allows a computer and the instrument **PROLITE-67** to communicate.

It allows you to download dataloggers from the instrument, view them and print them and make reports. Also it allows you to set the threshold values and update the firmware of the instrument.

4.2 Hardware and software Requirements

In order to use the program, your computer system need to meet the next requirements:

Hardware Requirements

Minimal Configuration:

- * IBM Computer compatible Pentium or higher.
- * 10 Mbytes of available space on the hard drive.
- * Mouse.
- * USB port available.

Software Requirements

This software runs under Windows® Operative System.

4.3 Installation

4.3.1 Software Installation

The installation file for the **PL-67 Control** software is contained in a **CD-ROM** supplied with the instrument. Before proceeding to install the program, read the following instructions.

- 1** Insert the installation CD into the **CD-ROM** drive of your computer.
- 2** Double click on the file which is into the folder "**SOFTWARE**" of the CD-ROM.
- 3** The install wizard will start automatically, which will help you during the installation process.



- 4 The installation program creates, by default, a new directory in **C:\Program Files\PROMAX\PROLITE-67**, where it copies all files of the application. It also puts a shortcut on the desktop and in Start \ Programs.
- 5 Double click on the shortcut icon **PROLITE-67** on the desktop to run the program.
- 6 In the section "*Operation Instructions*" is explained in detail the program operation.

4.4 Legal conditions

Read the contract carefully in its entirety before you install the program. Installing the program means that you have accepted the following terms and conditions:

- 1 **SUBJECT.** The subject matter of this Contract is the grant to the end user by **PROMAX ELECTRONICA, S. L.** a non-exclusive and non-transferrable personal license to use this version of the program for an indefinite period of time.
- 2 **LICENCE.** The Licence of Use granted hereby refers exclusively to the end user, who shall be considered legitimised to use the program only.
- 3 **OWNERSHIP OF THE SOFTWARE.** The end user acknowledges that the program referred to in this Contract is the exclusive property of **PROMAX ELECTRONICA, S. L.** The end user may only acquire the personal and nontransferrable right to use the software that is the subject matter of this Contract for the purposes herein expressed.

Since the program granted is protected by industrial and intellectual copyright, infringements by the user of these aforementioned obligations will give rise to the corresponding liabilities in accordance with the legislation in force.

- 4 **RESOLUTION.** The licence or authorisation of use is granted for an indefinite period of time. However, in the event of non-compliance by the end user with any of the clauses hereof, the Contract may as of right be terminated without any legal formality.
- 5 **EXPLANATORY PROVISION.** Notwithstanding the accuracy of the software granted, **PROMAX ELECTRONICA, S. L.** is fully exempt of liability for consequences arising from any possible omission existing in the program or from improper use by the end user of any of the information it contains and generates. Nor can **PROMAX ELECTRONICA, S. L.** be held liable for the suitability or accuracy of the data obtained for particular purposes or functions, since the only obligation of the latter, under this Contract, is the provision of means and not of results.



- 6 FINAL CLAUSE.** The use of this software referred to herein signifies the tacit and unconditional acceptance of its conditions.
- 7 JURISDICTION.** Both parties, explicitly waiving any rights that may correspond to them, agree to submit all controversies that may arise from this Contract to the jurisdiction and competence of the Judges ad Courts of Barcelona.

4.4.1 Connection between **PROLITE-67** and PC

The connection between **PROLITE-67** and **PC** is done via the data transmission cable **USB to mini-USB** supplied with the instrument.

Connect the **USB** connector to a free **USB** port of your PC. Connect the cable to the port of the **PROMAX** instrument.

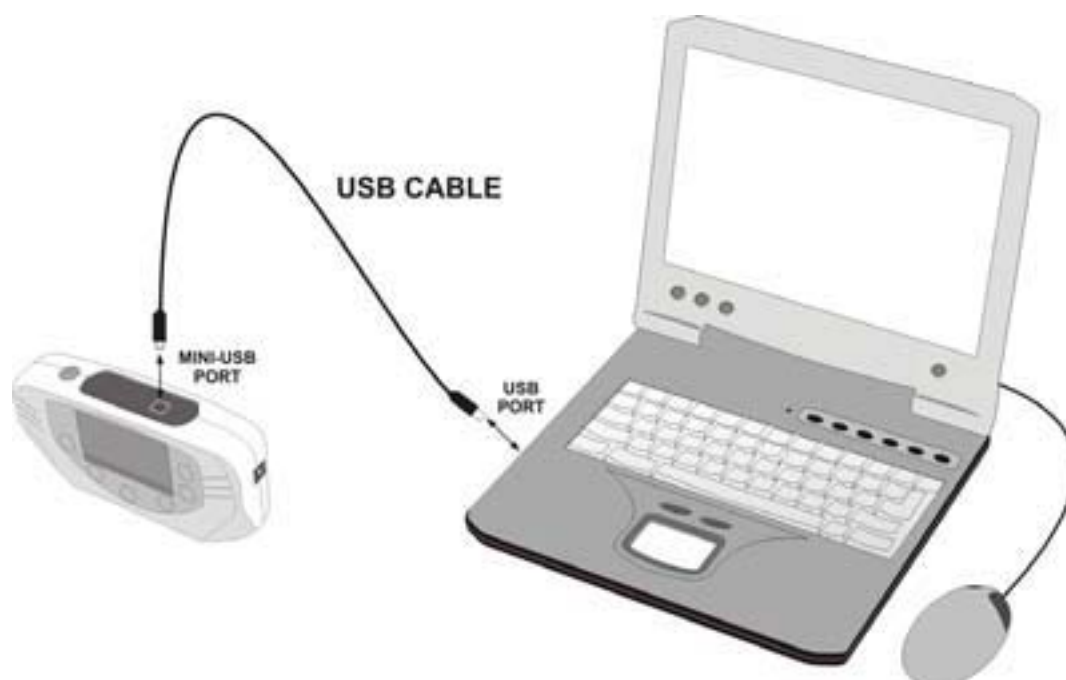


Figure 21.- Connection between **PROLITE-67** and **PC**.



When the instrument connects to the PC, the instrument shows the message **"Synchronizing USB with PC"** (Figure 22.-).

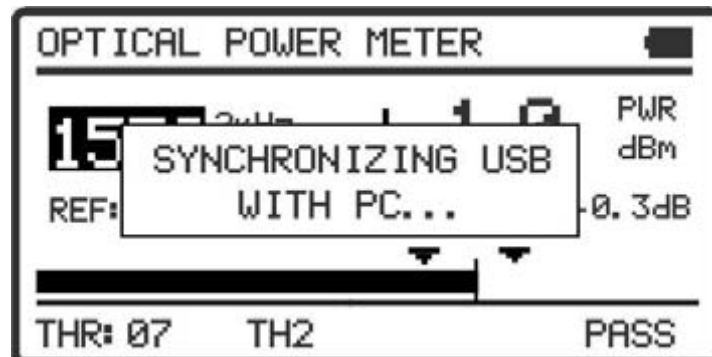


Figure 22.

If the instrument detects the control program is not running will give the message **"PC software is not detected"** (Figure 23.-). The program must be started before connecting the instrument.

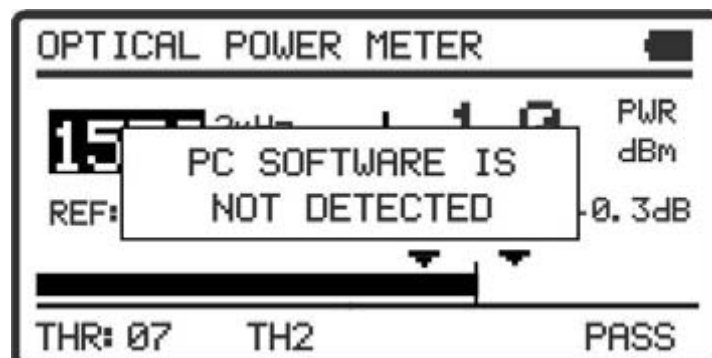


Figure 23.



5 INSTRUCTIONS FOR USING THE CONTROL SOFTWARE

5.1 Start

Follow next steps in order to start using the **PROLITE-67** Control Software:

- 1 Check the **PROLITE-67** is **ON**.
- 2 Check connection between **PROLITE-67** and computer.
- 3 Run the program by double clicking on the icon **PROLITE-67** which is located on the desktop.
- 4 The main window appears (see figure below).

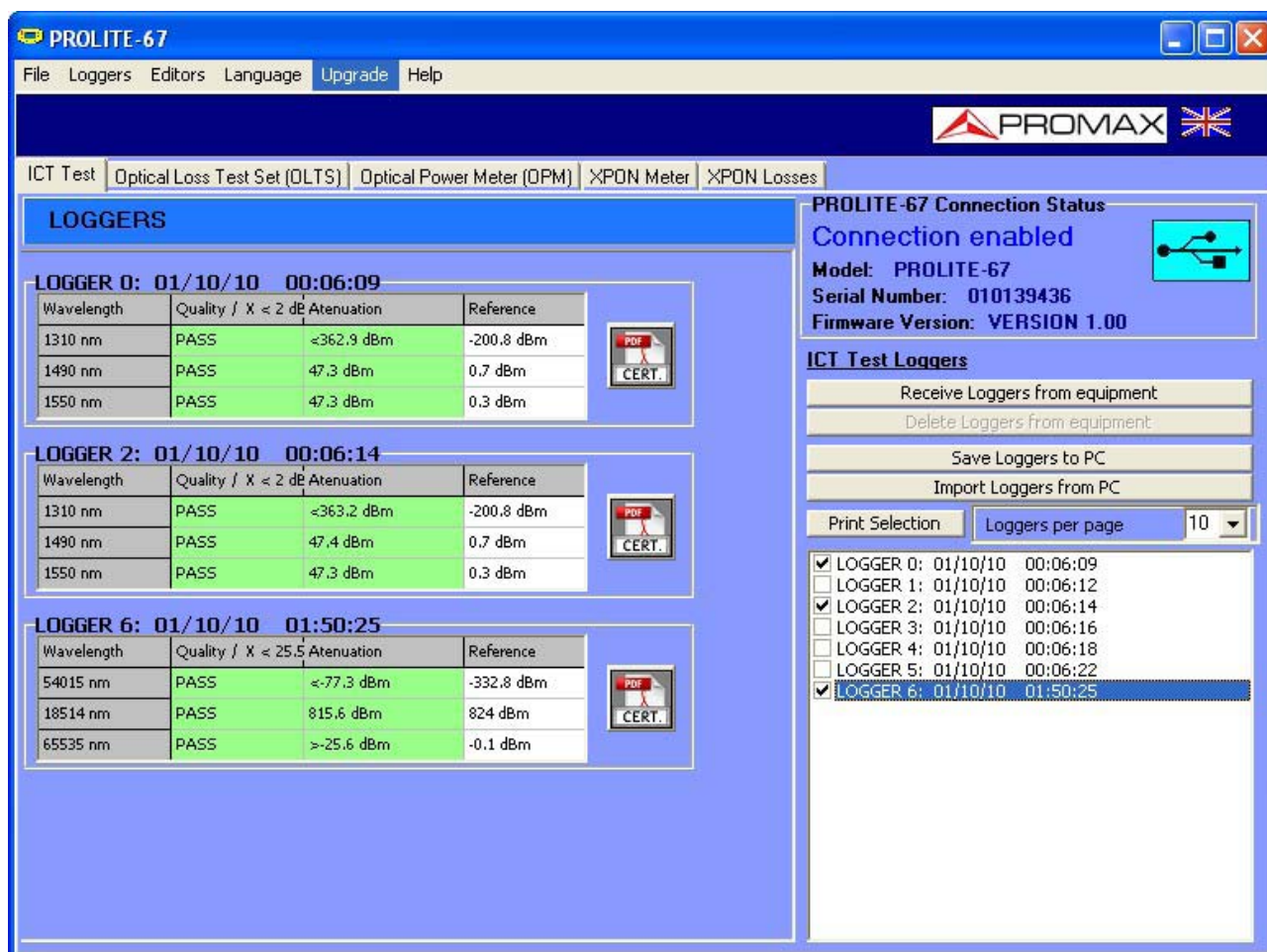


Figure 24.- PROLITE-67 Control Software Main Window.

The main window consists of a menu bar at the top. At the right side of the bar there is a flag symbolizing the language in use.



Below the menu bar appears the "Logger" window with 5 tabs corresponding to each one of the available functions in the instrument. This window shows logger data you want to watch.

At the right side of the "Logger" window there is a box that reports about the connection status. Below this box there are a series of buttons that allow you to perform various operations with loggers.

- 5 When the instrument **PROLITE-67** is identified at the **USB** port, it shows on screen some data about it such serial number and model.

NOTA LEGAL

In any case **PROMAX ELECTRONICA, S. L.** responsible for data loss or other damages that may cause this program directly or indirectly. Although we put our efforts in developing a useful and reliable product, it is understood that the use of the program and data and information generated with it are the sole responsibility of the user.

5.2 Main window

The main window, as shown in the figure below, has several different areas which are detailed next:

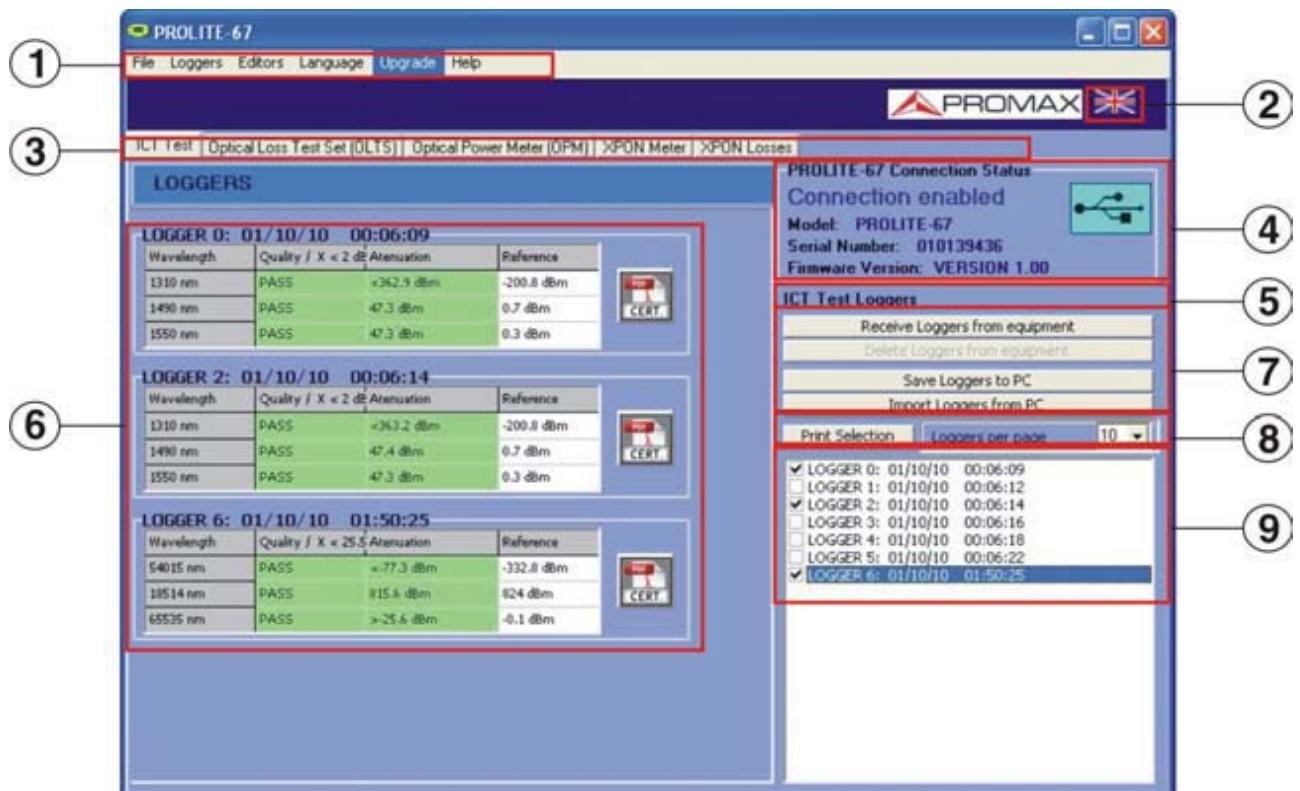


Figure 25.- Main window.


1
Menu Bar

There are the menus of the program (See section 6.3).

2
Language in use

It shows the flag identifying the selected language.

3
Active function selection tab

There are five tabs corresponding to each one of the five functions that are available at the program. They are: Attenuation Test, Optical Loss Test Set, Optical Power Meter, xPON Power Meter, xPON Losses Meter. When clicking on one of these tabs, you access a window where you can view the loggers function.

4
Connection Status

It shows data corresponding to the model, serial number and firmware. Only when the connection is succesful (see figure below):



Figure 26.- Connection enabled.

If the connection fails you see next figure:



Figure 27.- Connection disabled.

5
Active Function

It shows the name of the selected function.

6
Logger Display Window

It appears data loggers that have been selected at the Logger Selection Window.



7 Logger Options

It shows all the options you can do with loggers. To perform any of this options you have just to click on it. They are:

Receive loggers from the equipment:

It transfers the selected loggers at the active function from the instrument to the computer.

Delete loggers from the equipment:

It deletes on the equipment the loggers selected at the active function.

Save Loggers to PC:

It saves the selected loggers in a file. A navigation window pops up, where you can select the folder where you want to save the file. The file has an extension associated to the selected function.

Import Loggers from PC:

It imports loggers from a file. A navigation window pops up, where you can select the folder where the file is. The file should have the extension associated to the selected function.

8 Logger printing options

This area contains two options:

Print Selection:

It open the printing window in order to print the loggers selected at the selection window.

Loggers per page:

You can select how many loggers you want per page at printing.

9 Loggers selection Window

It appears all loggers loaded from the instrument or from the PC. If you want to view, print or make any operation on them you have to check the box next to the logger.

5.3 Menu bar

Menu bar has these options:

File: It contains the option to get out the program.

Loggers: It access to the 5 available options in the instrument.

Editors: It contains the option to edit upper and lower threshold values of each group.



Language: It contains the options to select the language in use at the program.

Upgrade: It contains the options to update the firmware of the instrument and to put the clock right.

Help: It contains the help information, contact details and version.

On the next sections each one of these menus are explained.

5.3.1 **File**

This menu contains the **Close** option.

The **Close** option closes the program (without confirmation).

5.3.2 **Loggers**

Options of this menu are:

- **Attenuation test**
- **Optical Loss Test Set (OLTS)**
- **Optical Power Meter (OPM)**
- **xPON Meter**
- **xPON Losses**

When clicking on any of these options, you active the window corresponding to that option, so you can carry out different actions on this function, such as import data, view loggers, make reports, etc. This option is equal to click on the tab corresponding to the option you want to activate.

The Attenuation Test option allows printing a full report with the data taken during the measurement in accordance with current regulations (fig 29). To print a report click on the icon next to the data record. Then fill in the details of the installation and click on Generate Certificate. A window will open to choose the place where you want to save the certificate file (in pdf format).



Figure 28.- Application form.

Wavelength	Attenuation	Reference	Quality
1310 nm	0.5 dB	0.0 dBm	PASS
1490 nm	2.1 dB	0.1 dBm	PASS
1550 nm	2.7 dB	0.5 dBm	FAIL

Figure 29.- Fiber Optics Certificate.



5.3.3 Editors

It contains these options: **Threshold Editor**, **ICT Threshold**, **Rename loggers** and **Delete all loggers**.

The **ICT Threshold** can define threshold values affecting measurements for certification in order to meet Infrastructure Telecommunication policies. This value can be sent to the instrument or received, depending on the option clicked.



Figure 30.- ICT Threshold screen.

The **Threshold Editor** can define the high and the low threshold values and the name for each group. This option only works when the instrument is connected to a computer.



Figure 31.- Threshold Editor screen.

When you first enter in this option it shows the threshold values received from the instrument.

Values can be modified by clicking on the corresponding box and writing the new value. To save values, click on Save. To load a group of values, clic on Load and select the file.

To send new values to the instrument click on the option **Send**.



To receive values from the instrument click on the option **Receive**.

The **Rename Loggers** function allows editing the name of each one of the 500 loggers per function that has each instrument. Name's loggers can be received, edited and sent to the instrument. Previously you should click on the function tab where you want to edit the names.

Rename loggers

You can rename your loggers with the function below.
Use Send/Receive for naming or consult loggers in equipment.

Optical Power Meter (OPM) XPON Meter XPON Losses
 ICT Test **Optical Loss Test Set (OLTS)**

Number	Acquired	Name
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Receive **Send**

Figure 32.



The **Delete all Loggers** function allows removing all loggers of each function. You should tick the function where you want to remove the loggers and then click on accept. All loggers' function will be removed at the instrument.

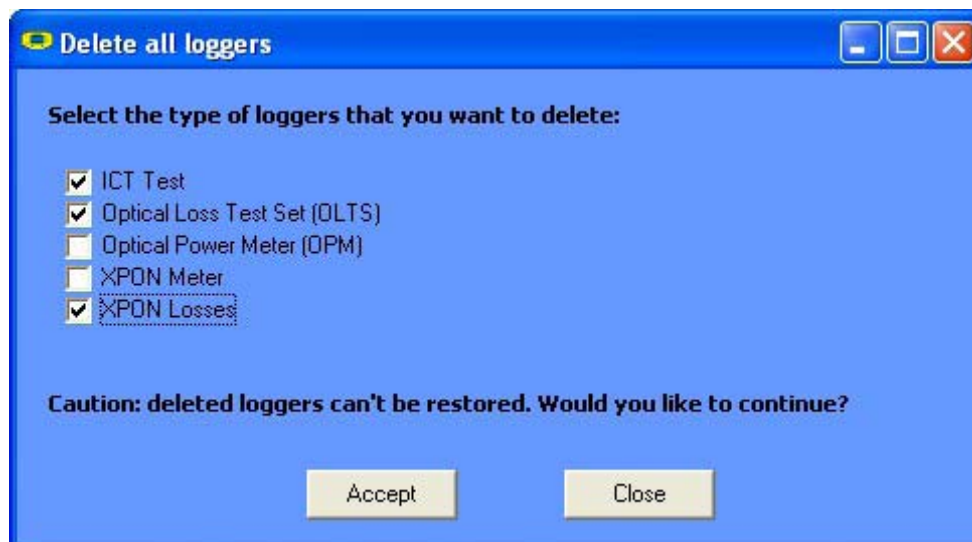


Figure 33.

5.3.4 Language

It allows you to select between **Spanish, English** or **Catalan**.

The active language is identified by a flag at the right side of the tool bar.

5.3.5 Upgrade

The Upgrade menu has two options:

The **Firmware** option allows you to update the firmware of the instrument **PROLITE-67** through upgrading files that can be obtained from the **PROMAX** webpage. Clicking on this option you open a navigation window in order to select the upgrading file (with extension "*.P67") used to upgrade the instrument.

The option **Set to Time** allows you to synchronise time from the computer to the instrument.

VERY IMPORTANT

Before proceeding with the upgrade to verify that the battery is charged **PROMAX**. **PROMAX** not disconnect the **USB** port while you are upgrading.



5.3.6 **Help**

The menu **Help** contains two options:

The option **Contents** presents information about the program.

The option **About PROLITE-67** presents information about the version and contact details.



6 SPECIFICATIONS

Bandwidth	
OLT/OPM Input	1310 nm \pm 50 nm. 1490 nm \pm 10 nm. 1550 nm \pm 15 nm.
ONT Input (Upstream channel)	1100-1700 nm.
Insertion Loss (ONT/OPM-OLT)	< 1.2 dB.
Polarization dependent loss	< 0.2 dB.
Connectors ONT, OLT	SC/APC.
Internal Fibre optic	9/125 μ m.
Dinamic Range	
Input OLT/OPM	-50 dBm to 20 dBm.
Input ONT (Burst)	-35 dBm to 20 dBm.
Accuracy	\pm 0.5 dB ¹ .
Modulation	Automatic detection at 230 Hz / 1 kHz / 2 kHz / 3 kHz.

VISUAL FAULT LOCATOR	
LASER type	FP.
Wavelenght	650 nm.
Optical Power	2 dBm (monomode fibre / class 2).
Modulation	1 Hz / 50 %.
Connector	Universal Receptacle 2.5 mm.

USB INTERFACE	Mini-USB connector B-type female. To transfer data, edit values and update firmware.
---------------	--

¹ OLT Input 1310 nm, 1490 nm, 1550 nm (<10 dBm).
ONT Input 1310 nm / 1600 nm (> -28 dBm).



ALIMENTATION	
Battery	Battery de Li Ion 7.4 V.
Low Battery Indicator	Graphic indicator on screen.
Operating time	Approx. 10 h.
Battery Charging	By fast internal charger.
External	
Voltage	12 V DC.
Consumption	13 W.
Mains Adapter	From 90 V to 250 V, 50-60 Hz (Included).

ENVIRONMENTAL CONDITIONS	
Equipment specifications are set in these environmental operating conditions. Operation outside these specifications are also possible. Please check with us if you have specific requirements.	
Altitude	Up to 2.000 m.
Temperature range	From 5 °C to 40 °C.
Max. relative humidity	80 % (up to 31 °C), decreasing lineally up to 50% at 40 °C.

MECHANICAL FEATURES	
Dimensions	W. 180 x H. 95 x D. 50 mm.
Weight	459 g. (battery and safety case included).

INCLUDED ACCESORIES	
AL-101B	Mains Adapter 90 - 250 V AC.
AA-12	Feeder cable car.
DC-272	Protection cover.
CA-05	Mains cord CEE-7.
CC-41	Data Transfer Cable USB to PC. Wrist strap. CD-ROM PROLITE-67. User's Manual.

ACCESORIOS OPCIONALES	
AD-095	Adapter 1.25 – 2.5 mm (VFL).
DC-270	Transport suitcase.



RECOMMENDATIONS ABOUT THE PACKING

It is recommended to keep all the packing material in order to return the instrument, if necessary, to the Technical service.



7 MAINTENANCE

This part of the manual describes the maintenance procedures and the location of faults.

7.1 Instructions for returning by mail

Instruments returned to repair or calibrate, either within or out of the guarantee period, should be send with the following information: Name of the Company, name of the contact person, address, phone number, receipt (in the case of coverage under guarantee) and a description of the problem or the service required.

7.2 Maintenance instructions

The maintenance steps to follow by the user consist of cleaning the cover and changing the battery. All other operations must be carried out by authorised agents or by qualified personnel.

7.2.1 Cleaning the cover

CAUTION



Do not use scented hydrocarbons or chlorized solvents. Such products may attack the plastics used in the construction of the cover.

The cover should be cleaned by means of a light solution of detergent and water applied with a soft cloth. Dry thoroughly before using the system again.

CAUTION



To clean the contacts, use a dry cloth. Do not use a wet or damp cloth.

CAUTION



Do not use for the cleaning of the front panel and particularly the viewfinders, alcohol or its derivatives, these products can attack the mechanical properties of the materials and diminish their useful time of life.



7.2.2 **Not replaceable fuses by user**

F1	FUS 2.5 A	T 125 V
F2	FUS 7 A	T 125 V



8 APPENDIX A: APPLICATION NOTE

Quick guide to certificate a telecommunication installation.

A.- Capturing reference measures.





- 1 Connect a pigtail to the **PROLITE-105** output connector.
- 2 Connect another pigtail to the **OLT** input connector of the **PROLITE-67** (See figure A).
- 3 Use the **SC-SC** adapter to connect both pigtails.
- 4 Power on the **PROLITE-105** and the **PROLITE-67**.
- 5 Select the **ATTENUATION TEST** function in the **PROLITE-67**.
- 6 Press once the **SEQ**  key to select the **SIMULTANEOUS** mode in the **PROLITE-105**.
- 7 Capture the reference values of the wavelengths by pressing   simultaneously for 1 second both cursor keys in the **PROLITE-67**.
- 8 Now you can measure at each access point its attenuation.



Figure A.

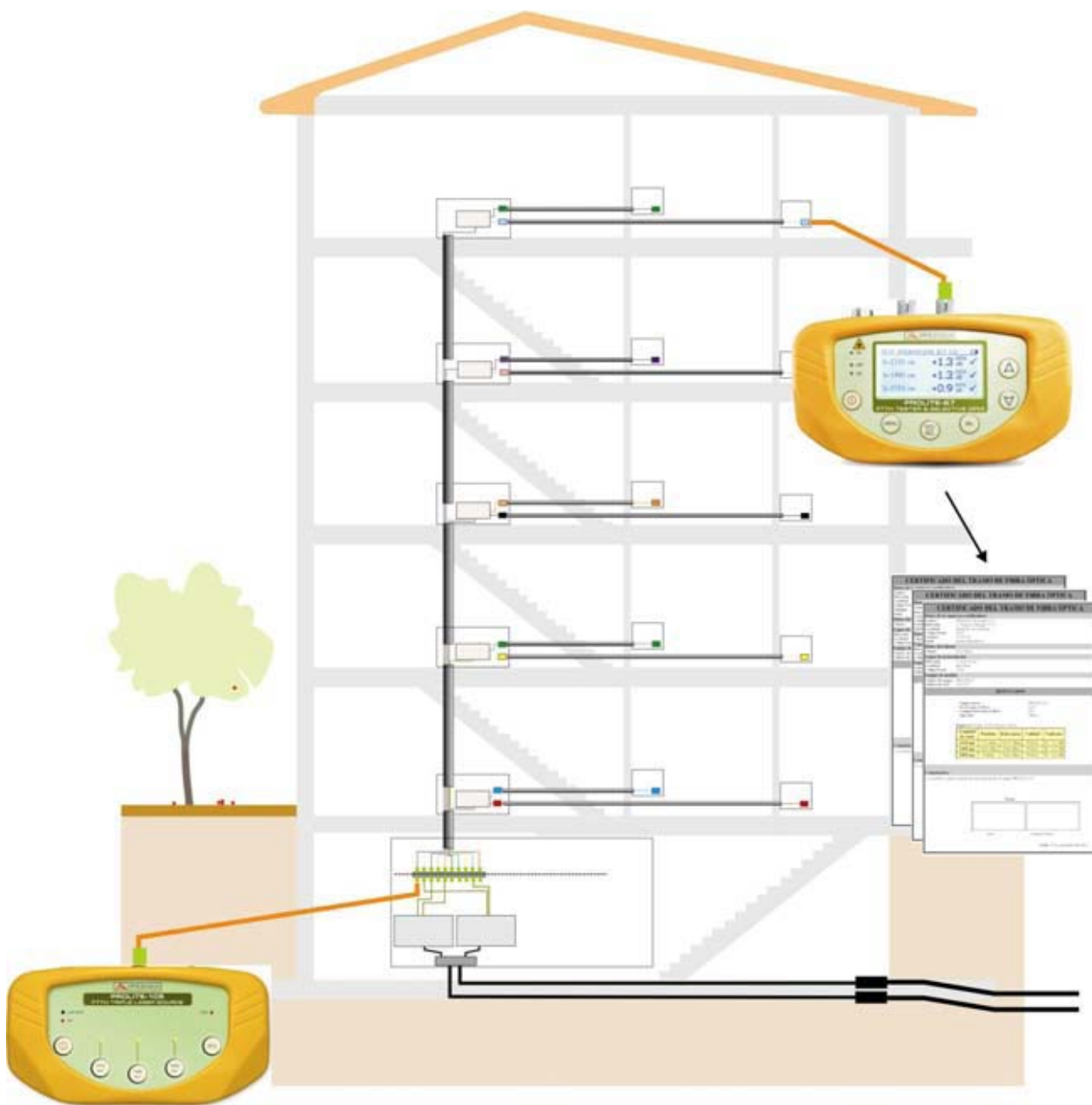


B.- Measuring Attenuation Test.

- 1 Connect the **PROLITE-105** in a source node of the transmitting optical network, such in a free strip of the general telecommunication cabinet at the building.
- 2 Keep the **PROLITE-105** in **SIMULTANEOUS** mode. The source generates simultaneously the same wavelength (1310 nm, 1490 nm and 1550 nm).
- 3 Connect the **PROLITE-67** in a receiving node of the optical network that you want to measure, such as a UAP (User Access Point).
- 4 Activate the **ATTENUATION TEST** function on the **PROLITE-67**.
- 5 Check the measurement and store it on the memory of the device by pressing the key .
- 6 Repeat the previous step for each one of the access points (see figure B).

C.- Printing the Certification Report.

- 1 Connect the **PROLITE-67** to the PC where you have installed the control software.
- 2 Run the control software.
- 3 Click on the **ICT Test** tab.
- 4 Click on the **Receive loggers from the equipment** button.
- 5 The lower right window shows the loggers stored on the instrument.
- 6 Select some records for making a report.
- 7 Click on the **CERT** icon that is on the right of the data record.
- 8 Fill in the information and click on **Generate Certificate**.
- 9 It generates a ICT certification report in PDF format that is saved by default in the Certificates folder or in a folder selected by the user (see figure C).



MEASURING A GENERAL INSTALLATION OF A FIBER OPTIC NETWORK.

Figure B.



OPTICAL FIBER'S SECTION CERTIFICATE			
Data from the certification company			
Name:	PROMAX Electrónica S. L.		
Address:	C/ Francesc Moragas 71-75		
City:	Hospitalet de Llobregat		
Zip Code:	08907		
Phone:	931847700		
Email:	promax@promax.es		
Customer data			
Name:	Eduardo Calvo		
Install location			
Address:	c/Gran Via		
City:	Barcelona		
Zip Code:	08032		
Measurement Equipment			
Unit name:	PROLITE-67		
Serial number:	11111111		
RESULTS			
Emitter equipment:	prolite-105		
Fiber's section Id.:			
Fiber's section length:	45m		
Threshold:	2.5 dB		
Operator:	Albert		
LOGGER 0: Date: 01/10/10 Time: 00:06:09			
Wavelength	Attenuation	Reference	Quality
1310 nm	0.5 dB	0.0 dBm	PASS
1490 nm	2.1 dB	0.1 dBm	PASS
1550 nm	2.7 dB	0.5 dBm	FAIL
COMMENTS			
<p>Signature:</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="border: 1px solid black; width: 200px; height: 80px; margin-bottom: 10px;"></div> <div style="border: 1px solid black; width: 200px; height: 80px; margin-bottom: 10px;"></div> </div> <div style="display: flex; justify-content: space-around;"> <div>Customer</div> <div>Company/Operator</div> </div> <div style="text-align: right; margin-top: 20px;">Date: January 24, 2011</div>			

Figure C.



PROMAX ELECTRONICA, S. L.

Francesc Moragas, 71-75
08907 L'HOSPITALET DE LLOBREGAT (Barcelona)
SPAIN
Tel. : 93 184 77 00 * Tel. Intl. : (+34) 93 184 77 02
Fax : 93 338 11 26 * Fax Intl. : (+34) 93 338 11 26
<http://www.promaxelectronics.com>
e-mail: promax@promaxelectronics.com