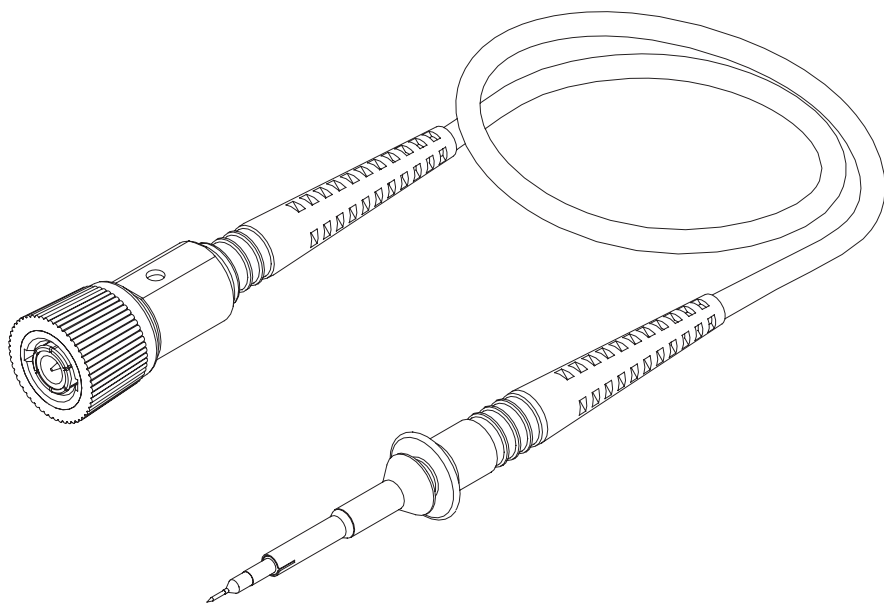




designed for  
OMICRON Lab



# PML 1110

High Impedance Passive Probe

Instruction Manual

[sales@telesplicing.com.tw](mailto:sales@telesplicing.com.tw)



Information in this publication supersedes that in all previously published material.  
Specifications are subject to change without notice.

## **Manufacturer**

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PMK Mess- und Kommunikationstechnik GmbH  
Königsteiner Str. 98  
65812 Bad Soden, Germany

## **Warranty**

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PMK GmbH warrants this measurement accessory for normal use and operation within specifications for a period of two (2) years from date of shipment and will repair or replace any defective product which was not damaged by negligence, misuse, improper installation, accident or unauthorized repair or modification by the buyer. This warranty is applicable only to defects due to material or workmanship. PMK GmbH disclaim any other implied warranties of merchantability or fitness for a particular purpose. PMK GmbH will not be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of use or data, interruption of business and the like), even if PMK GmbH has been advised of the possibility of such damages arising from any defect or error in this manual or product.



(EC conformity marking)

The manufacturer declares the conformity of this product with the actual required safety standards in accordance with the Low Voltage Directive (LVD) 2006/95/EC:

CEI/IEC 61010-031:2008

Safety requirements for electrical equipment  
for measurement, control and laboratory use -

Part 031:

Safety requirements for hand-held probe  
assemblies for electrical measurement and test

## **WEEE/ RoHS Directives**

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(EC conformity marking)

This electronic product is classified within the WEEE/ RoHS\* category list as monitoring and control equipment (category 9). Category 9 products are exempted from the restrictions under the scope of the RoHS directive.

Your help and efforts are required to protect and keep clean our environment. Therefore return this electronic product at the end of its life either to the Service Department of PMK Mess- und Kommunikationstechnik GmbH or take care of separate WEEE collection and professional WEEE treatment yourself. Do not dispose as unsorted municipal waste.

\* EC Directives:

WEEE Directive 2002/96/EC	-	Waste Electrical and Electronic Equipment
RoHS Directive 2002/95/EC	-	Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment

Definitions and Examples (Clause 6.5.2)

<b>Measurement Category I</b>	<b>Definition:</b>	Measurement category I is for measurements performed on circuits not directly connected to a mains supply.
	<b>Examples:</b>	Measurements in circuits not derived from a mains supply and specially protected (internal) circuits derived from a mains supply. In the latter case, transient stresses are variable; for that reason it is required that the transient withstand capability of the equipment is made known to the user.
<b>Measurement Category II</b> CAT II	<b>Definition:</b>	Measurement category II is for measurements performed on circuits directly connected to the low voltage installation.
	<b>Examples:</b>	Household appliances, portable tools and similar equipment.
<b>Measurement Category III</b> CAT III	<b>Definition:</b>	Measurement category III is for measurements performed in the building installation.
	<b>Examples:</b>	Measurements on distribution boards, circuit breakers, wiring including cables, bus-bars, junction boxes, switches, socket-outlets in the fixed installation and equipment for industrial use like for example stationary motors with permanent connection to the fixed installation.
<b>Measurement Category IV</b> CAT IV	<b>Definition:</b>	Measurement category IV is for measurements performed at the source of the low-voltage installation.
	<b>Examples:</b>	Electricity meters and measurements on primary over current protection devices and and ripple control units.

**IEC Pollution Degrees**

Definitions (Clause 3.5.6 )

<b>Pollution Degree 1</b>	No POLLUTION or only dry, non conductive POLLUTION. NOTE The POLLUTION has no influence.
<b>Pollution Degree 2</b>	Only- non conductive POLLUTION. Occasionally, however, a temporary conductivity caused by condensation must be accepted.
<b>Pollution Degree 3</b>	Conductive POLLUTION occurs or dry, non-conductive POLLUTION occurs which becomes conductive due to condensation which is to be expected.

The following symbols may appear on the product or in this instruction manual:



Caution, risk of danger. Refer to manual.



Caution, risk of electric shock.



Earth (ground) TERMINAL.

## Safety Information

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To avoid personal injury and to prevent fire or damage to this product or products connected to it, review and comply with the following safety precautions. Be aware that if you use this probe assembly in a manner not specified the protection this product provides may be impaired.

**Only qualified personnel should use this probe assembly.**

**Use only grounded instruments.**

Do not connect the probe ground lead to a potential other than earth ground. Always make sure the probe and the measurement instrument are grounded properly.

**Connect and disconnect properly.**

Connect the probe output to the measurement instrument and connect the ground lead to earth ground before connecting the probe to the circuit under test. Disconnect the probe input and the probe ground lead from the circuit under test before disconnecting the probe from the measurement instrument.

**Observe probe and probe accessory ratings.**

Do not apply any electrical potential to the probe input which exceeds the maximum ratings of the probe or the accessories connected to it. In a combination always the *lower* rating / measurement category applies to both probe and accessories connected to it.

Make sure to comply with the voltage versus frequency derating curve on page 8.

**Keep away from live circuits.**

Avoid open circuitry. Do not touch connections or components when power is present.

**Do not operate with suspected failures.**

Refer to qualified service personnel.

**Indoor use only.**

Do not operate in wet/damp environment. Keep product surfaces dry and clean.

**Do not operate the product in an explosive atmosphere.**

Specifications that are not defined to be guaranteed are typical and are published as general information to the user. The instrument should have warmed-up for at least 20 minutes and the environmental conditions do not exceed the probe's specified limits.

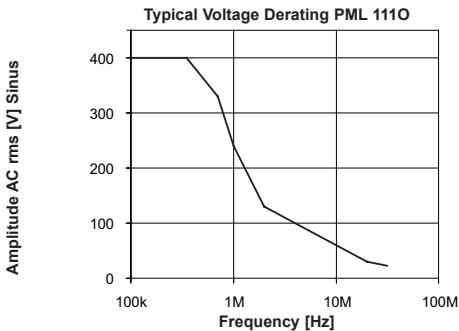
Electrical specifications

Attenuation Ratio <sup>(1)</sup>	10:1	± 2 % at DC
Voltage Coefficient	0.00025 %/V	at DC
System Bandwidth	50 MHz	(passband   < -1dB)
Probe Risetime	7 nsec	(10 % - 90 %)
Maximum Rated Input Voltage <sup>(2)</sup>	400 V rms	
Measurement category I:	1250 V transient overvoltage	
Measurement category II:	300 V rms CAT II	
Pollution Degree <sup>(2)</sup>	2	

Voltage Derating



*Note that the max. input voltage rating of the probe decreases as the frequency of the applied signal increases.*



- (1) Connected to grounded measurement equipment with an input impedance of 1 MΩ ± 1 %.
- (2) As defined in IEC 61010-031. See definitions explained on page 4 and 5.

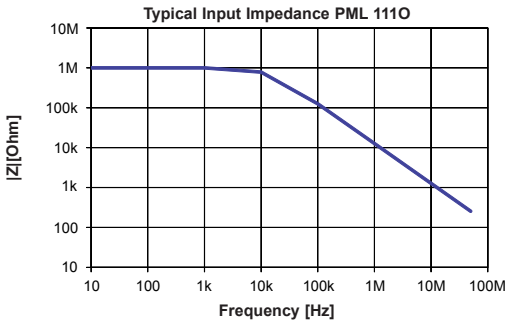
Electrical Characteristics

Input Resistance (System)	1 MΩ	± 1 %
Input Capacitance (System)	12.5 pF	
Compensation Range	40 pF - 55 pF	
Input Coupling of the Measuring Instrument	1 MΩ AC / DC	

Input Impedance



*Note that the input impedance of the probe decreases as the frequency of the applied signal increases.*



**Mechanical Characteristics**

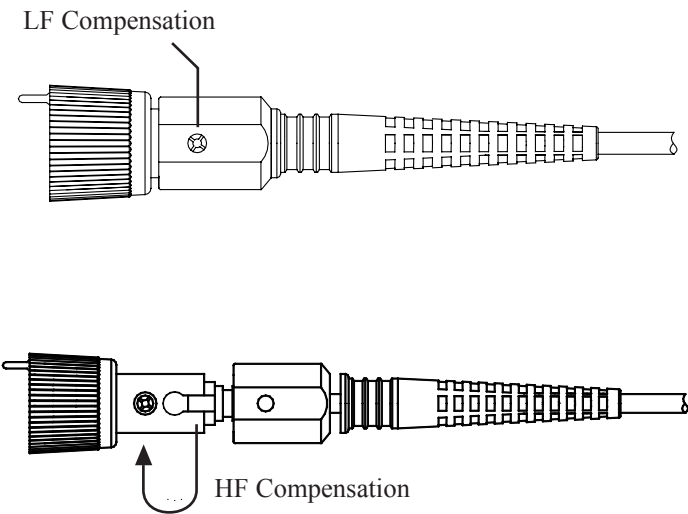
Weight (probe only)	48 g
Cable Length	1.3 m
Probe Tip Diameter	2.5 mm

**Environmental Specifications**

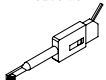
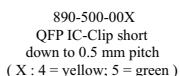
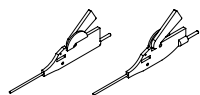
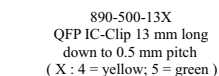
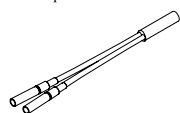
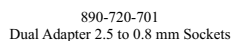
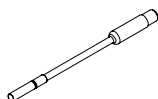
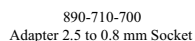
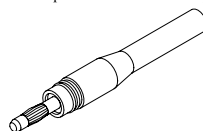
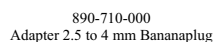
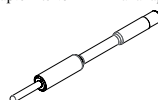
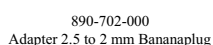
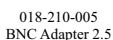
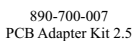
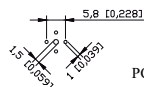
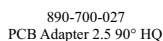
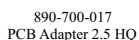
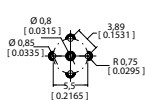
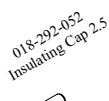
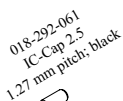
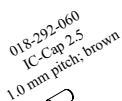
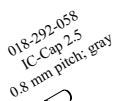
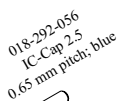
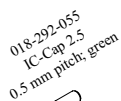
Altitude	operating	up to 2000 m
	non-operating	up to 15000 m
Temperature Range	operating	0° C to +50° C
	non-operating	-40° C to +71° C
Maximum Relative Humidity	operating	80 % relative humidity for temperatures up to +31° C, decreasing linearly to 40 % at +50° C

**Adjustment Procedures**

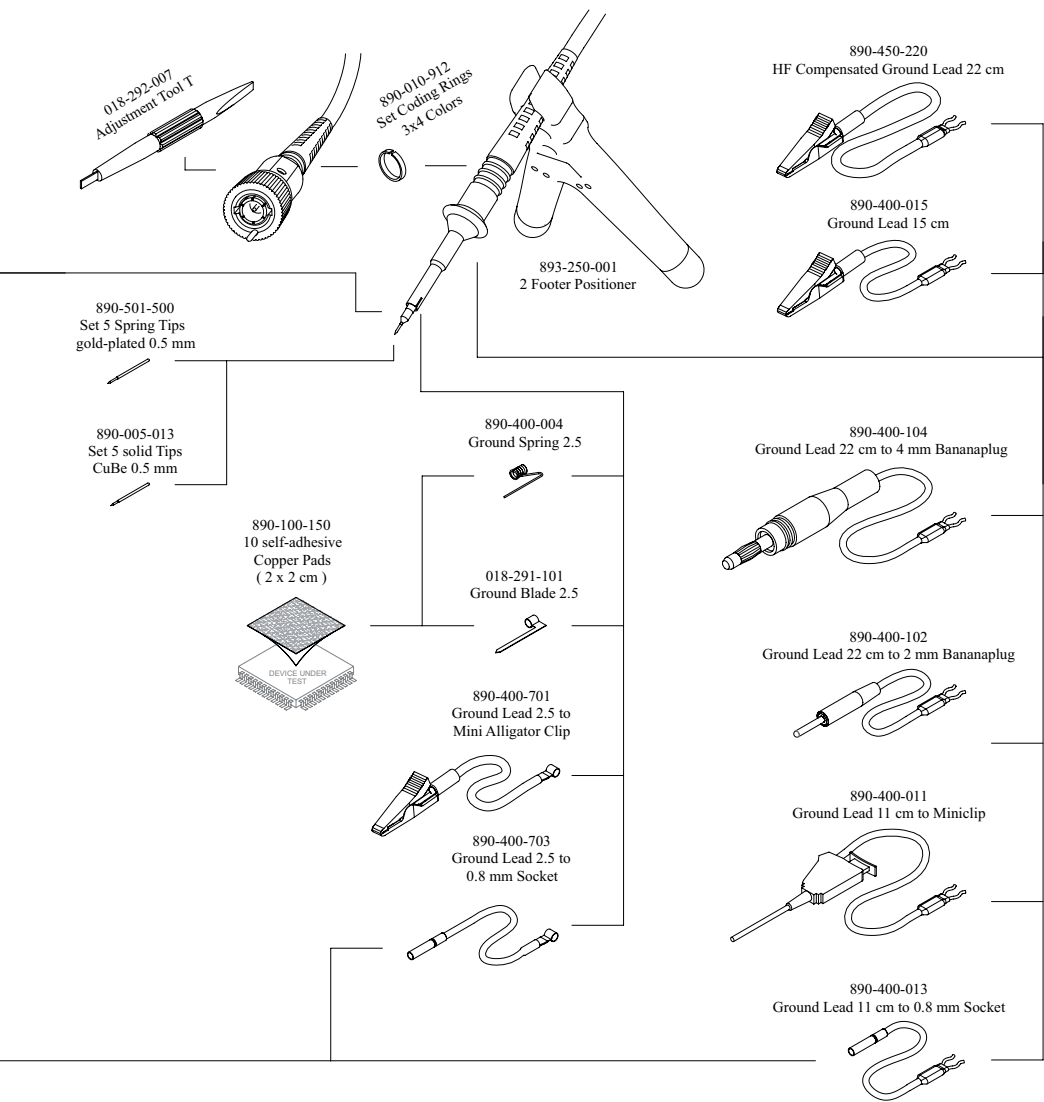
The probe can be adjusted for low frequency (LF) compensation and for high frequency (HF) compensation, as shown in the following two pictures.



Accessory available from PMK GmbH: [www.pmk.de](http://www.pmk.de)







The following items are included in the scope of delivery. Please check the delivery for completeness. If any item is missing, send a message to our service department and we will send you this item immediately.

Item	Qty
BNC Adapter	1
Coding Rings (set) 3x4 Colors	1
Ground Lead 15 cm	1
Ground Spring 2.5	1
Instruction Manual	1
Insulating Cap 2.5	1
PCB Adapter Kit 2.5	1
Probe	1
Protection Cap 2.5	1 (1)
Solid Tip CuBe 0.5 mm	1
Spring Tip gold plated 0.5 mm	1 (2)
Sprung Hook 2.5	1

(1) plugged on probe  
(2) installed in probe



*Use ground lead only for connections to earth ground.*



*The BNC Adapter is rated: 42 V pk AC + DC*



*The accessories provided with the probe have been safety tested. Do not use any other accessories than those “originally” provided.*

**Handling**



Handle with care especially when fitted with the extra thin and sharp spring contact tip to avoid any injury. Note that the probe cable is a sensitive part of the probe. Do not damage through excessive bending or pulling. Avoid mechanical shock to this product in general to guarantee accurate performance and protection.

**Maintenance**

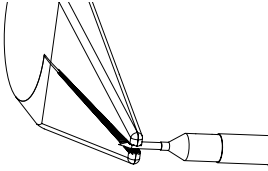
**Cleaning**

To clean the exterior of the probe use a soft cloth moistened with either distilled water or isopropyl alcohol. Before use allow the probe to dry completely.

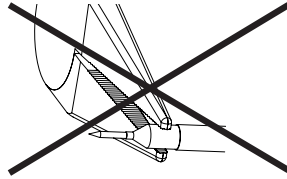
## Changing the Probe Tip

To change the probe tip use pliers to grip and pull it carefully straight out of its contact socket, along the axis of the probe. Do not grip the white plastic insulator or the housing with pliers, because the tip could be squeezed and cannot be removed and respectively the probe could be damaged.

If the probe tip is removed, the new tip can be inserted with pliers into the contact socket, along the axis of the probe. In order to insert the probe tip completely into the housing, press the probe tip against a hard surface carefully.



Use pliers to grip and pull the probe tip carefully out of its contact socket.



Do not grip the white plastic insulator or the probe housing with pliers.

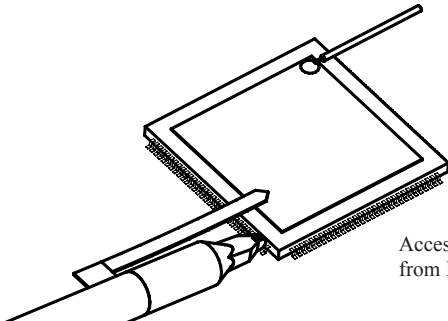
## About PML Probe Series

The compact design with only 2.5 mm housing diameter at the probe tip is ideal for measurements of SMT components. It provides a much better visibility over of the DUT (device under test) as conventional 5 mm probe housing designs.

A true PMK GmbH feature the exchangeable probe tip is also available for the PML series. The gold plated spring contact or the rigid tip are only 0.5 mm in diameter. The tip replacement is easy and gives the engineer the best choice.

Particularly for HF measurements on IC's, a short as possible ground connection is recommendable. Due to long ground leads most conventional adaptations bring additional inductance and resonances into the measurement which will result in false or inaccurate readings. The innovative IC contacting system of the PML with 5 different IC adapters from 0.5 to 1.27 mm pitch in combination with the ground blade and IC ground copper pad is the ideal solution for short-circuit-safe, reproducible, and authentic measurements.

These great advantages and over 30 accessories parts for the new PML probe series will offer various configuration to solve most adaptation desires.



IC contacting system with IC adapter, ground blade and IC ground copper pad.

Accessory shown in this picture could be obtained from PMK and is not in the scope of delivery.

