

Thank you for purchasing the model 701940 10 MHz Passive Probe. To ensure correct use, please read this manual thoroughly before beginning operation. After reading the manual, keep it in a convenient location for quick reference whenever a question arises during operation.

Contact information of Yokogawa offices worldwide is provided on the following sheet.

- PIM113-01Z2 List of worldwide contacts

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YOKOGAWA

IM 701940-01E
7th Edition

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the software's performance and functions. The figures given in this manual may differ from those that actually appear on your screen.
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- Copying or reproducing all or any part of the contents of this manual without the permission of YOKOGAWA is strictly prohibited.

The following symbols are used in this manual.



Improper handling or use can lead to injury to the user or damage to the instrument.
This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions. The same symbol appears in the corresponding place in the user's manual to identify those instructions. In the manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."

WARNING

Calls attention to actions or conditions that could cause serious or fatal injury to the user, and precautions that can be taken to prevent such occurrences.

CAUTION

Calls attentions to actions or conditions that could cause light injury to the user or damage to the instrument or the user's data, and precautions that can be taken to prevent such occurrences.

Note

Calls attention to information that is important for proper operation of the instrument.

Safety Precautions

This product is designed to be used by a person with specialized knowledge.

Make sure to comply with the safety precautions mentioned hereafter when handling the probe.

YOKOGAWA assumes no responsibility for any consequences resulting from failure to comply with these safety precautions. Also, read the User's Manual of the measuring instrument thoroughly so that you are fully aware of its specifications and handling, before starting to use the probe.

This manual is part of the product and contains important information. Store this manual in a safe place close to the instrument so that you can refer to it immediately. Keep this manual until you dispose of the instrument.

The following symbols are used on this instrument.



Handle with care. Refer to the user's manual or service manual. This symbol appears on dangerous locations on the instrument which require special instructions for proper handling or use. The same symbol appears in the corresponding place in the manual to identify those instructions.

Make sure to comply with the following safety precautions in order to prevent accidents such as an electric shock which impose serious health risks to the user and damage to the instrument.



WARNING

Grounding of the measuring instrument

Make sure to connect the protective grounding of the measuring instrument.

Ground lead of the probe

Make sure to connect the ground lead of the probe to the grounding potential.

Connecting the object of measurement

Make sure to avoid an electric shock when connecting the probe to the object of measurement. Do not remove the probe from the measuring instrument after the object of measurement is connected.

Handling of the passive probe

Do not touch the probe's input terminal or the probe itself with wet hands.

Make sure not to exceed the oscilloscope's maximum input voltage in the following cases:

- When the probe attenuation ratio is 1:1
- When the oscilloscope's input coupling is AC
DC voltage of the same electric potential as the probe's input is applied to the oscilloscope's input.

Do not operate with suspected failures

If you suspect that there is damage to this probe, contact your nearest YOKOGAWA dealer or sales representative.

Do not operate in wet/damp conditions

To avoid electric shock, do not operate this probe in wet or damp conditions.

Do not operate in explosive atmosphere

To avoid injury or fire hazard, do not operate this probe in an explosive atmosphere.

Do not disassemble or modify

Do not disassemble or modify the product. YOKOGAWA assumes no liability if you disassemble or modify the product.

Avoid exposed circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Damaged Signal Cable

If the signal cable is torn and the inner metal is exposed or if a color different from the outer sheath appears, stop using the cable immediately.



CAUTION

Maximum input voltage

Do not supply any voltages exceeding the maximum input voltage to the probe.

French



AVERTISSEMENT

Mise à la terre de l'instrument de mesure

S'assurer de connecter la mise à la terre protectrice de l'instrument de mesure.

Fil de terre de la sonde

S'assurer de connecter le fil de terre de la sonde au potentiel de mise à la terre.

Connexion de l'objet de la mesure

S'assurer d'éviter un choc électrique lors de la connexion de la sonde à l'objet de la mesure.

Ne pas retirer la sonde de l'instrument de mesure après avoir connecté l'objet de la mesure.

Manipulation de la sonde passive

Ne pas toucher le terminal d'entrée de la sonde ou la sonde elle-même avec des mains mouillées.

S'assurer de ne pas dépasser la tension d'entrée maximum de l'oscilloscope dans les cas suivants

- Lorsque le ratio d'atténuation de la sonde est 1:1
- Lorsque le couplage d'entrée de l'oscilloscope est en CA.
La tension en CC du même potentiel électrique que l'entrée de la sonde est appliquée à l'entrée de l'oscilloscope.

Ne pas utiliser en cas de défaillances suspectées

Si vous suspectez que la sonde est endommagée, contactez votre revendeur ou représentant commercial YOKOGAWA.

Ne pas utiliser dans des conditions humides

Afin d'éviter un choc électrique, ne pas utiliser cette sonde dans des conditions humides."

Ne pas utiliser dans une atmosphère explosive

Afin d'éviter des risques de blessures ou d'incendie, ne pas utiliser cette sonde dans une atmosphère explosive.

Ne pas démonter ou modifier

Ne pas démonter ou modifier le produit. YOKOGAWA se dégage de toute responsabilité si vous démontez ou modifiez le produit.

Éviter les circuits exposés

Afin d'éviter des blessures, retirer les bijoux comme les bagues, montres et autres objets métalliques. Ne pas toucher les connexions et les composants exposés après mise sous tension.

Câble de signal endommagé

Si le câble de signal est déchiré et que le métal intérieur est exposé ou si une couleur différente de la gaine externe est visible, arrêter immédiatement d'utiliser ce câble.



ATTENTION

Tension d'entrée maximum

Ne pas appliquer à la sonde de tension dépassant la tension d'entrée maximum.

Waste Electrical and Electronic Equipment



Waste Electrical and Electronic Equipment (WEEE), Directive

(This directive is valid only in the EU.)

This product complies with the WEEE directive marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category

With reference to the equipment types in the WEEE directive, this product is classified as a "Monitoring and control instruments" product.

When disposing products in the EU, contact your local Yokogawa Europe B.V. office.

Do not dispose in domestic household waste.

Authorized Representative in the EEA

Yokogawa Europe B.V. is the authorized representative of Yokogawa Test & Measurement Corporation for this product in the EEA. To contact Yokogawa Europe B.V., see the separate list of worldwide contacts, PIM 113-01Z2.

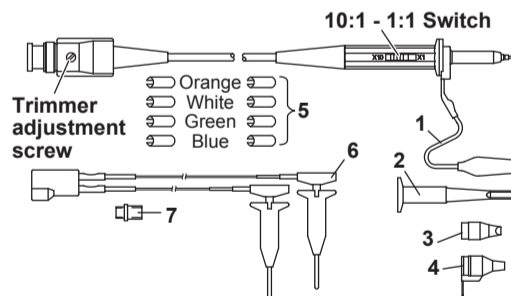
Description

The model 701940 is a 10 MHz passive probe with switchable attenuation ratio of 10:1 and 1:1.

This probe can be used for oscilloscopes with input impedances of 1 MΩ.

Appearance

This probe is composed of the probe and its accessories. Optional accessories are available to meet various applications.



Standard Accessories

Name	Part No.
1 Ground lead	B9852CW
2 Pinchers tip	B9852CX
3 IC test tip	B9852CY
4 Ground attachment	B9852CZ
5 Marker tip	B9852DH

Optional Accessories (Sold Separately)

Name	Part No.
6 Mini clip converter	B9852CR
7 BNC adapter	B9852CS

Specifications

Item	Specifications	Conditions
Probe length	1.5 m	
Connector type	BNC	
Input resistance ¹	10 MΩ ±2%	In conjunction with an oscilloscope with an input impedance of 1 MΩ ±1%.
Matching Input Capacity (at 10:1)	Approx. 17 pF to 40 pF	Oscilloscope measurement input capacity
Input capacitance		
At attenuation ratio of 10:1:	22 pF ±10%	In conjunction with an oscilloscope with an input impedance of 1 MΩ ±1%.
At attenuation ratio of 1:1:	200 pF max.	Probe only
Attenuation ratio ¹	(10:1) ±2% or less	In conjunction with an oscilloscope with an input impedance of 1 MΩ ±1%.
Bandwidth		
At attenuation ratio of 10:1:	10 MHz (-3 dB or less)	Subject to change depending on type of oscilloscope used.
At attenuation ratio of 1:1:	DC to 6 MHz (-3 dB or less, typical ²)	Subject to change depending on type of oscilloscope used and measurement conditions.
Rise time		
At attenuation ratio of 10:1:	35 ns max.	Subject to change depending on type of oscilloscope used.
At attenuation ratio of 1:1:	58 ns max. (typical ²)	Subject to change depending on type of oscilloscope used and measurement conditions.
Max input voltage ¹	600 V (DC + AC peak) or 42 V (DC + AC peak)	This voltage acceptable if the oscilloscope input is non-isolated (the GND part of the input has the same electric potential as the protective grounding), and the attenuation factor is 10:1. If the attenuation factor is 1:1, the acceptable voltage is the max. input voltage on the oscilloscope.
Operating environment	Temperature range +5°C to +40°C	
	Humidity range 20% RH to 80% RH	
Storage environment	Temperature range -20°C to +70°C	
	Humidity range 80% RH or less	
Operating altitude	2000 m or less	
Safety standard	EN61010-031	
	Measurement category II, ³ 600 V (DC + AC peak)	
	Pollution degree 2 ⁴	
Environmental standard	EN50581 Monitoring and control instrument	

1: In case of selecting the attenuation as 10:1. The maximum allowable input decreases depending on the frequency. Refer to the derating curve.

2: Typical (or average) value; not guaranteed.

3: The measurement category of this instrument is category II. Do not use it to measure the main power supply or for Measurement Categories III, and IV. Measurement category II applies to measurement of circuits, such as household electric appliances and portable electric tools, that are connected to low-voltage installations.

Measurement category III applies to measurement of facility circuits, such as distribution boards and circuit breakers.

Measurement category IV applies to measurement of power source circuits, such as entrance cables to buildings and cable systems, for low-voltage installations.

4: Pollution Degree: Applies to the degree of adhesion of a solid, liquid, or gas which deteriorates withstand voltage or surface resistivity. Pollution Degree 2 applies to normal indoor atmospheres (with only non-conductive pollution).



WARNING

- The maximum input voltage for isolated input is more strictly limited than for non-isolated input. This is due to the fact that, unlike non-isolated input in which GND is protected by a protective grounding potential, the GND for isolated input is floating (insulated), so any protection via protective grounding is disabled.
- When using this probe for isolated input, you must use it with 42 V or less for both the H and L sides. In particular, the GND shell has exposed metal so there is a high risk of electric shock. Even when a high potential only exists on the H side, high voltage can still occur on the L side creating a very dangerous condition.
- Even when the voltage of the non-isolated input is within the maximum, to ensure that current flows to the protective grounding circuit the protective grounding (from the power supply's 3-prong terminal) of the main unit must be enabled, and for plug-in modules, the module attachment screws must be securely fastened.
- This probe has a 10:1 - 1:1 switch. Be sure to heed the following cautions when switching the probe.
 - Confirm the oscilloscope's maximum input voltage when switching the probe to 1:1. Accidentally introducing excessive input can damage the input section.
 - Do not switch the probe while voltage is being input. This is extremely hazardous.

French



AVERTISSEMENT

- La tension d'entrée maximum pour une entrée isolée est strictement plus limitée que pour une entrée non isolée. Ceci est dû au fait que, contrairement à une entrée non isolée dans laquelle le GND est protégé par un potentiel protecteur de mise à la terre, le GND pour une entrée isolée est flottant (isolé), désactivant ainsi toute protection via une mise à la terre protectrice.
- Lors de l'utilisation de cette sonde pour une entrée isolée, vous devez l'utiliser en 42 V ou moins pour les côtés H et L. En particulier, la coque GND possède des parties métalliques exposées, d'où un risque de choc électrique élevé. Même lorsqu'un potentiel élevé existe uniquement sur le côté H, une haute tension peut tout de même être présente sur le côté L, créant ainsi une condition très dangereuse.
- Même lorsque la tension de l'entrée non isolée ne dépasse pas le maximum, afin de s'assurer que le courant passe jusqu'au circuit protecteur de mise à la terre, la mise à la terre protectrice (du terminal à 3 broches de l'alimentation électrique) de l'unité principale doit être activée, et pour les modules enfichables, les vis de fixation du module doivent être bien serrées.
- Cette sonde possède un commutateur 10:1 - 1:1. S'assurer de respecter les précautions suivantes lors de l'allumage de la sonde.
 - Confirmer la tension d'entrée maximum de l'oscilloscope lors de l'allumage de la sonde sur 1:1. Introduire accidentellement une entrée trop élevée peut endommager la section d'entrée.
 - Ne pas allumer la sonde au moment de la mise sous tension. Ceci est extrêmement dangereux.

Operation

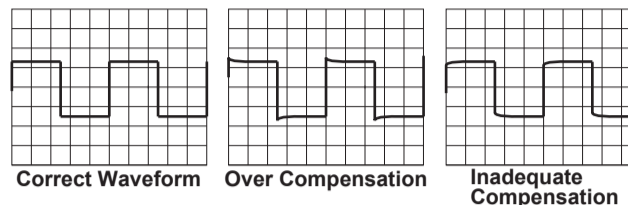
Use adequate attachment suitable for the point to measure. Before using the probe with attenuation ratio of 10:1, adjust its capacitance by tuning the trimmer.

The attenuation can be selected using the 10:1 - 1:1 switch.

Make sure the maximum input voltage of oscilloscope when the attenuation is selected as 1:1.

Adjustment

- Connect the probe connector to the input of the oscilloscope, and connect the tip of the probe to the CAL signal output terminal.
- Change the Time/Div and the V/Div to get the display shown below. And tune the trimmer to get the correct waveform.



Max Input Voltage derating curve

