



GPS Synchronization unit

A 1355

Instruction manual

Version 1.2, Code no. 20 751 793

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1 Warnings

To ensure a high level of operator's safety during using of GPS Synchronization unit the following warnings have to be considered:

-  **Do not use the device if any damage is noticed!**
-  **Consider all generally known precautions in order to avoid risk of electric shock while dealing with electric installations!**
-  **If the GPS Synchronization unit is used in a manner not specified in this Instruction manual, the provided protection can be impaired!**

2 Introduction

A 1355 GPS Synchronization unit guarantees that the time clock uncertainty of the Metrel power quality analyzers does not exceed ± 10 ms for 50 Hz signals, according to IEC 61000-4-30.

This performance is necessary to ensure that instruments produce the same aggregation results when connected to the same signal. GPS Synchronization unit can only be used on the MI 2892 Power Master, MI 2792 PowerQ4 Plus and MI 2792A PowerQ4 Plus instrument.

The Global Positioning System (GPS) is a space-based global navigation satellite system that provides reliable time information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to one satellite. It is maintained by the United States government which is solely responsible for its accuracy and maintenance.

GPS Synchronization unit operation

On figure below main parts of GPS Synchronization unit are shown:

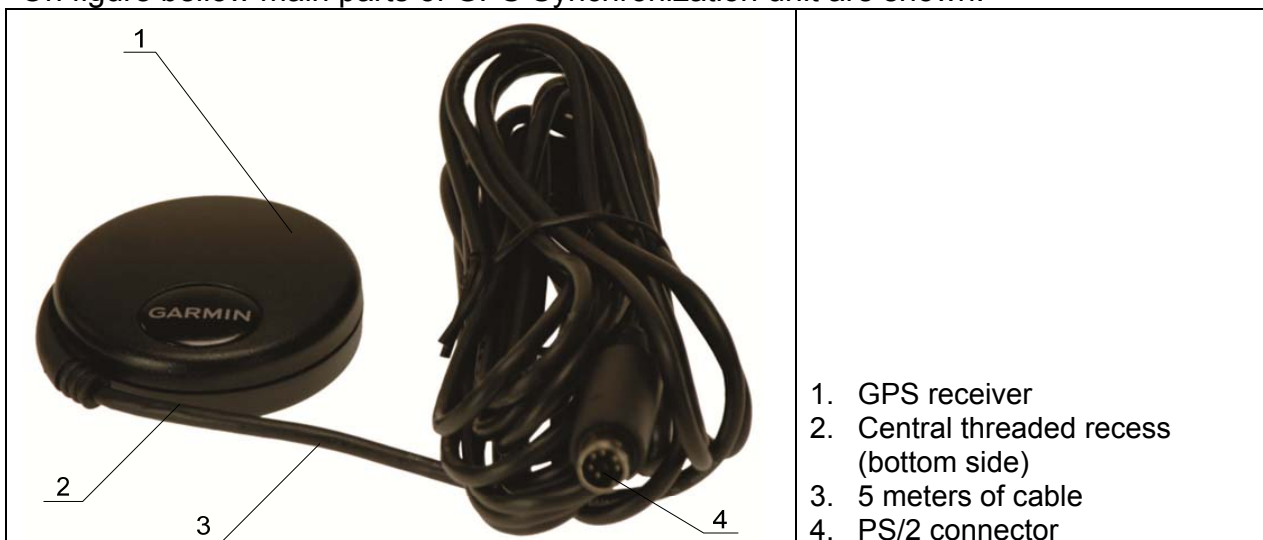


Figure 1: Description of GPS Synchronization unit

2.1 MI 2892 Power Master Synchronization

In order to put device into work the following procedure should be followed:

1. Device unit should be placed outside of building. The GPS requires an open, clear view of the sky. Buildings, covered parking areas, tunnels and dense foliage can cause the GPS receiver to be unable to get correct time. Additionally unit can be secured with embedded magnetic sticker or M3 screw.

Note: Make sure that the GPS Synchronization unit (including connection cable) is not in contact with dangerous live voltage.

2. Connect PS/2 connector to MI 2892 Power Master instrument.
3. Go to General Setup menu → Communication menu and set GPS – Enabled

Note: GPS cannot be enabled in RS-232 PC connection mode.

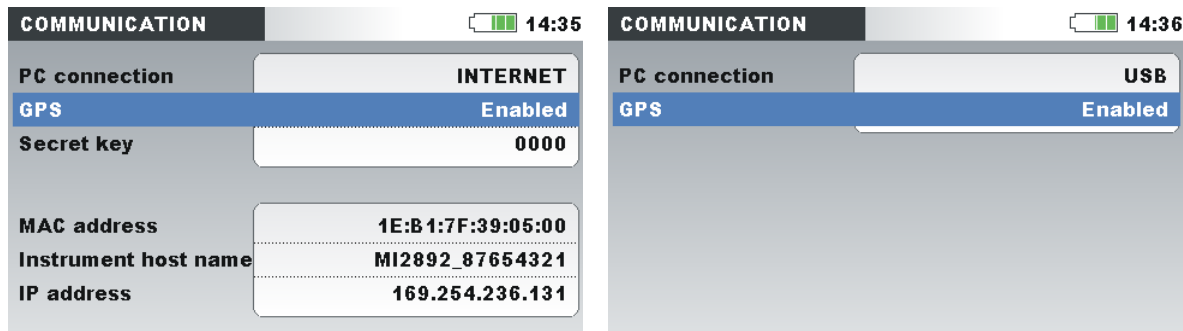


Figure 2: Enable GPS module

- Go to Setup → Time & Date menu and select your time zone

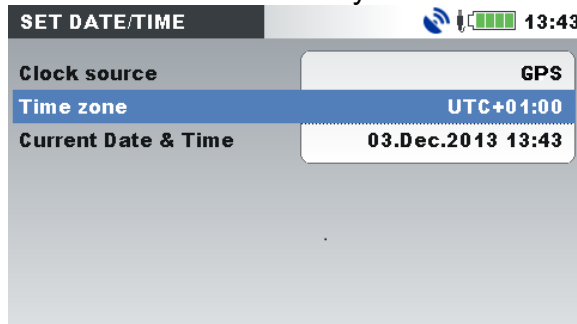


Figure 3: Select Time zone

- Status line on screen will notify user about current GPS status.

	GPS detected	GPS module detected, position not valid or no satellite GPS signal reception.
	GPS time valid	GPS module detected, satellite GPS signal reception, date and time valid and synchronized, synchronization pulses active



Note: After GPS plug in, device can take up to few minutes to synchronize with satellite.

Power Master is now synchronized and ready for measurements (recordings) according to the IEC 61000-4-30.

2.2 MI 2792 / MI 2792A PowerQ4 Plus Synchronization

In order to put device into work the following procedure should be followed:

- Device unit should be placed outside of building. The GPS requires an open, clear view of the sky. Buildings, covered parking areas, tunnels and dense foliage can cause the GPS receiver to be unable to get correct time. Additionally unit can be secured with embedded magnetic sticker or M3 screw.
Note: Make sure that the GPS Synchronization unit (including connection cable) is not in contact with dangerous live voltage.
- Connect PS/2 connector to PowerQ4 Plus instrument.
- PowerQ4 Plus status line on MAIN MENU will notify user about current GPS status.

	GPS detected	GPS module detected, position not valid or no satellite GPS signal reception.
	GPS time valid	GPS module detected, satellite GPS signal reception, date and time valid and synchronized, synchronization pulses active

Note: After GPS plug in, device can take up to few minutes to synchronize with satellite.

Once GPS is synchronized with satellites instrument will demand from the user to set the correct time zone (date and hour), as shown on figure below.

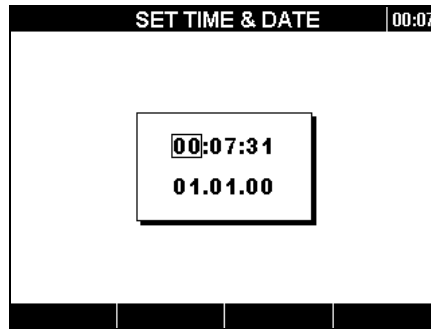





Figure 4: Setting the time zone (hour)

Use   keys to select correct time zone (hour) and confirm selection with  key.

PowerQ4 Plus is now synchronized and ready for measurements (recordings) according to the IEC 61000-4-30.

3 Typical applications

3.1 Observing on two or more points on network

By using two or more synchronized instruments by means of GPS unit, user can perform simultaneous measurement on the different network points. GPS unit assures that instruments are synchronized during EN 50160 surveys. Additionally same configuration can be used for troubleshooting, for example to estimate disturbance impact on network or susceptible load. The following figure shows instrument placement in that case. PowerQ4 Plus instruments are placed on:

- motor - source of disturbance (aggressor),
- server room (victim) – victim of disturbance
- transformer –path of disturbance spreading into network

By using instruments recorders (transient, inrush and waveform) and PowerView software user can observe disturbance spreading over the network and estimate impact under various conditions.

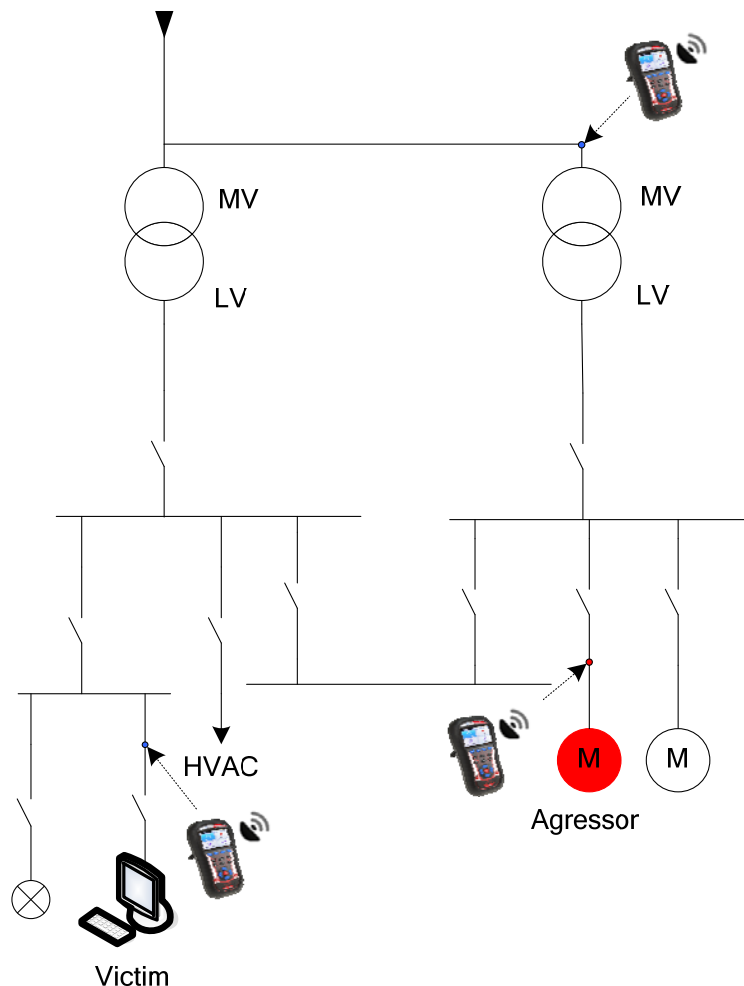


Figure 5: Distributed network measurement

4 Maintenance

4.1 Inspection

To maintain operator safety and ensure reliability of the GPS Synchronization unit it is good practice to inspect it on a regular basis. Check that the enclosure and optional connection are without defects such as scratches or breaks.

4.2 Cleaning

Use a soft cloth moistened with soapy water or alcohol to clean the surface of a device and leave it to dry totally before using it.

Warning:



Do not use liquids based on petrol or hydrocarbons!

4.3 Service

There are no user serviceable parts. For repairs under or out of warranty time please contact your distributor for further information.

5 Technical Specifications

Dimensions	67 mm x 19 .5mm (Φ x h)
Weight	< 200 g
IP	67
Cable length	5 m
Power consumption	100mA @ 5V
Receiver sensitivity	-185 dBW
Operating temperature	-30 °C ÷ 80 °C
Storage temperature	-40 °C ÷ 90 °C
Satellite acquisition time	45 s
Time accuracy	±10 ms
Mounting	Embedded magnetic sticker 4 mm central deep recess for M3 screw
Connector	PS/2 male