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SPI-II

GPS-Phase Identification System
The SPI-II is an instrument which enables remote identification of A-B-C electrical phases from all 50 and 60 Hz networks.
Besides doing identification, the instrument enables verification of phase concordance and rotation in all safety and on any network points.

Introduction

The growing complexity of electric networks, the deregulation in transiting energy and the emerging automation of operations are factors that have urged energy distributors to make sure that their equipment (default indicators, electric meters, tele-measurement and measurement equipment, SCADA remote controls, etc.) are connected on the right network phases.

The SPI-II enables correct identification of phases on any given point of an electric network. This has become more and more essential whenever one wants to optimize the planning, the operation and the upkeep of installations.

Operating the SPI-II system

Phase reading is rapidly and accurately accomplished by comparing the obtained measurements on one point of the network to the others which are already known and identified. The SPI-II accomplishes this comparison by synchronizing phase A (reference) samples and the sample of the phase to be identified (measurement) using a signal originating from the GPS satellite network.

The system comprises two units: the set unit (reference) and the mobile unit (measurement).

The mobile unit allows the user to identify the phases on any point of an overhead or underground network, no matter the physical distance separating it from the set unit of reference.

During the measurement, the distant module (reference) transmits a sample of the reference phase A, synchronized by GPS, towards the mobile unit. The transmission is made on demand from the mobile unit by cellular phone.

The measurement module is used to make phase detection. This can be accomplished by directly connecting to the network with a wall socket or socket capacitor on a cable.

The measurement phase on an overhead network uses the probe for the exterior SPI-IISx, set on a handling rod. The measurement module, then placed at the lower end of the rod, receives the data from the sensor by infrared link.

The repeat module then compares the sample of the measurement module, which was received by radio link along with the (phase A) sample received by phone from the reference unit.

The A, B or C comparison result is then posted on the measurement module.

Wireless Technology

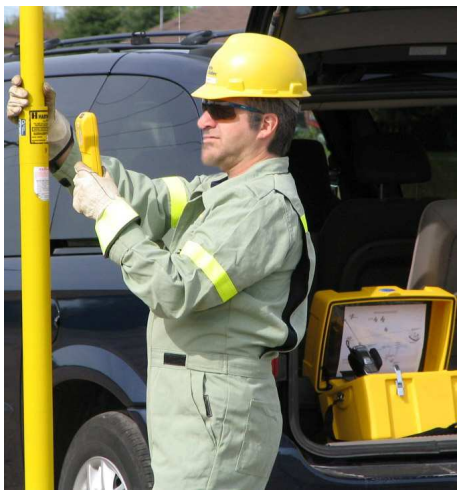
The exchanged data between modules are transmitted through different types of wireless links, such as: by infrared (short distance), by radio (medium distance), by cellular linkage (long distance), Bluetooth and finally, by GPS (very long distance). As for measurement taking, the user only handles the measurement module, which is similar in size and in weight to a flash light. Furthermore, the absence of cables facilitates storage and equipment maintenance.

Advantages :

- Ultra rapid micro-processing equipment
- Long distance use ensured by the ultra accurate synchronization of the GPS satellite network and cellular telephony
- Minimal cabling (RF & IR links between the elements)
- No off tension of the network to identify
- Automatic detection of the communication input signals and of the measurement module
- Automatic compensation of the connections ±30 degrees (DY,YD)
- Enhanced portability
- Low power consumption

Applications :

- Planning, operation and maintenance of electrical networks
- Network equipment installation such as: transformers, cutting equipment, etc.
- Installation of measuring and tele-measurement equipment (SCADA)
- Network Parallelism
- Balancing of charges between phases
- Geo-referenced mapping of the network's points
- Reconstruction of overhead networks following natural disasters
- Information updating of networks' plans and databases
- Activating transport lines, distribution arteries, electrical stations and substations.
- Identification of dubious electrical phases in order to improve the quality of the wave, etc.
- Etc.



Technical Specifications :

Distant Module (SPI-IID)

Two 50-250 volts ca. reference inputs
An interface for RJ-11C phone line
A 12- volt c.c. input supply
An external GPS connection interface module

Repeat Module (SPI-IISr)

- Bluetooth for connection to cellular
- RF communication link towards the programmed probe
- Powered by rechargeable batteries
- RF reception of the mobile GPS unit
- Portable shock resistant polyethylene casing

General Specifications:

Global Resolution ± 2°
Automatic detection + 30° et -30°
Automatic Selection of the measuring source

Maximum distance between modules :
Between the SPI-IIGPS and the SPI-IISr :
25 meters (RF)
Between the SPI-IISr and theSPI-IISi :
25 meters (RF)
Between the SPI-IISx and the SPI-IISi :
10 meters (infrared)
Between the SPI-IIGPSFx and the SPI-IID :
30-meter cable
Between the SPI-IID and the SPI-IISi :
Global distance between both measurements : 800 km

Portable GPS Module (SPI-IIGPS)

- GPS signal reception
- GPS signal retransmission on radio link
- Powered by Ni-Mh rechargeable battery
- Minimum autonomy of 8 to 10 hours
- RF minimum reach : 20 meters

- **External Probe (SPI-IISx)**
- Automatic activation with a voltage ranging from >2kV to 25 kV
- Phase transmission by infrared
- Powered by 9-volt batteries
- Standard fastening for isolated rod.

Intelligent Probe (SPI-IISi)

- Signal reception through the mobile unit radio link
- 50 to 250 V input voltage or
- Optical receiver for external probe

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