

GPS - Raspberry PI - Web technology - a real-time clock for systems without Internet connection

Simple and flexible - precise and reliable supply, web-based parameterisation, secure intranet.

XAPI XTimeServer is an implementation that provides PCs, systems and other devices with the world time clock without an external connection (Internet). The simplest and most cost-effective solution is to connect a GPS receiver to the Raspberry PI mini-computer, which provides precise position and time determination functions. These are necessary for devices and systems that do not have a fixed location or internet connection but require precise timing functions. The real-time clock is supplied to these clients and systems via a secure connection. The Raspberry PI and the received time are configured and controlled via an ordinary internet browser on the laptop, tablet or smartphone.

TRANSPARENCY AND UP-TO-DATENESS

For a smooth workflow and production process, the presence of the real-time clock is of enormous importance or even indispensable. However, many companies and production facilities do not allow external connection to the internet. Simple modern solutions/technologies such as the use of a mini-computer with a GPS receiver enable permanent availability of the world time clock with the guarantee of a secure internal network within the company.



RASPBERRY PI

It is a mini-computer solution that can handle everyday tasks as well as being ideally suited for unusual projects. As hardware, the Raspberry Pi is the basis for a simple and fast implementation of solutions for distributed systems without the large, bulky standard computers. The low power consumption, the manageable acquisition costs and yet an infinite wealth of possible uses create completely new perspectives and freedom for the realisation of networked systems. The mini-computer, the size of a credit card, invented by the Raspberry Pi Foundation, is already being successfully implemented in various XAPI projects.



FUNCTION AND ARCHITECTURE

View and edit

- The Web Client provides each authorised employee / administrator with a user interface with input options for configuring the network (IP config, NTP) and the times (GPS time refresh, time input).
- The different times can be checked and synchronised with the correct UTC time at any time.

Processing data

- The Raspberry Pi, on which the individual server components are installed, serves as the communication centre between LAN clients or other devices and users.
- A GPS receiver is connected to the **Raspberry Pi**, which receives the coordinated world time UTC from a satellite, if a connection is available. The received (GPS UTC) time is adjusted by the time offset of the local time. The offset of Central European Time is plus one hour and in summer plus two hours.

Connection to the system

- By connecting the GPS receiver to the Raspberry Pi, the received time is displayed on the one hand in the web application and on the other hand requested and picked up by the connected clients and devices via a secure connection to the Network Time Protocol (NTP).



PURPOSE / BENEFIT

- Location-independent access to clock times with the possibility of correction (**cloud computing**).
- **Data availability** exists **on different end devices**, all functions can be monitored seamlessly and continuously.
- **Secure network within the company.**
- Plant safety, productivity and maintenance are increased in the long term.
- Simple and intuitive analysis tool and user-friendly operation.
- The narrow central infrastructure enables low hardware, installation, maintenance, support and licensing costs.
- The module checks at all times whether server applications, communication channels and components of the overall system are working smoothly. Malfunctions become visible immediately (**reporting system**).

TECHNOLOGY

- The central infrastructure enables low hardware, installation, maintenance, support and licence costs.
- No client installation: any device with a web browser can be a client (tablets, smartphones...) - without plug-ins.
- It is operated with standard browsers (without Java applet).
- Software documents and data are located on the web server.

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