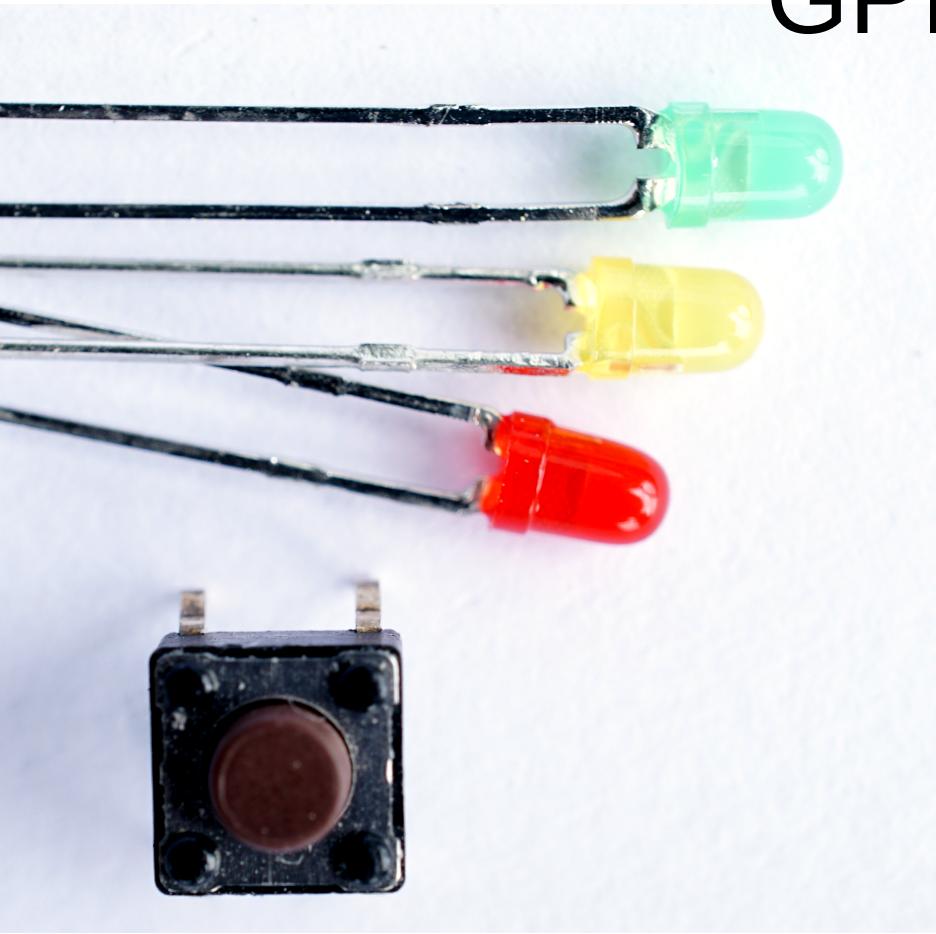


# Pi and More 9

Workshop   Raspberry Pi  
Scratch  
GPIO



Gerhard Hepp

# Raspberry Pi

Populärer Microcomputer

ARM-basiert

Linux

Microcontroller-Peripherie GPIO, SPI, I2C, Seriell, USB

# Scratch

Integrierte Entwicklungsumgebung 'IDE'

Insbesondere für Programmieranfänger entwickelt und geeignet.

In Version 1.4 auf Raspberry Pi verfügbar.



# Scratch hatte ursprünglich keine Hardwareanbindung, seit Version 1.3 mit dem „Remote Sensors Protocol“



## Remote Sensors Protocol

*This article or section documents an outdated version of Scratch (version 1.3/1.4). For this article in the current version, see [Scratch Extension Protocol \(2.0\)](#).*

The **Remote Sensors Protocol** or **Scratch Extension Protocol** is an experimental extension feature that allows interaction between Scratch (1.3+) and other programs.

### Contents [hide]

- [1 Introduction](#)
- [2 Protocol](#)
- [3 Message Types](#)
- [4 Common Message Types](#)

## Introduction

Three kinds of interaction are supported:

- sharing [broadcasts](#) (in both directions)
- virtual sensors
- Scratch's global [variables](#) are made visible

## Protocol

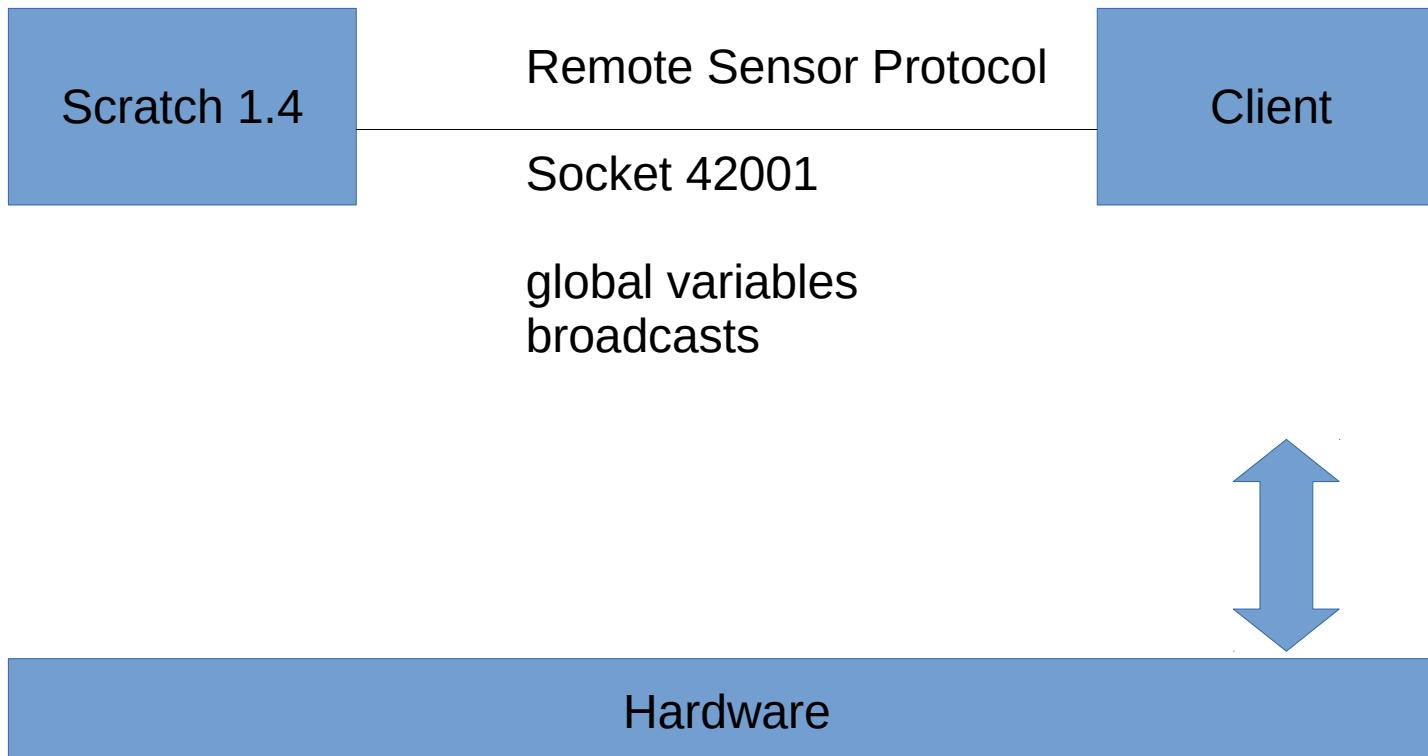
The experimental extension feature is enabled using the right-button menu on one of the two [sensor blocks](#). When remote sensors are enabled, Scratch listens for connections on TCP port 42001.

Once a connection is established, messages are sent in both directions over the socket connection.

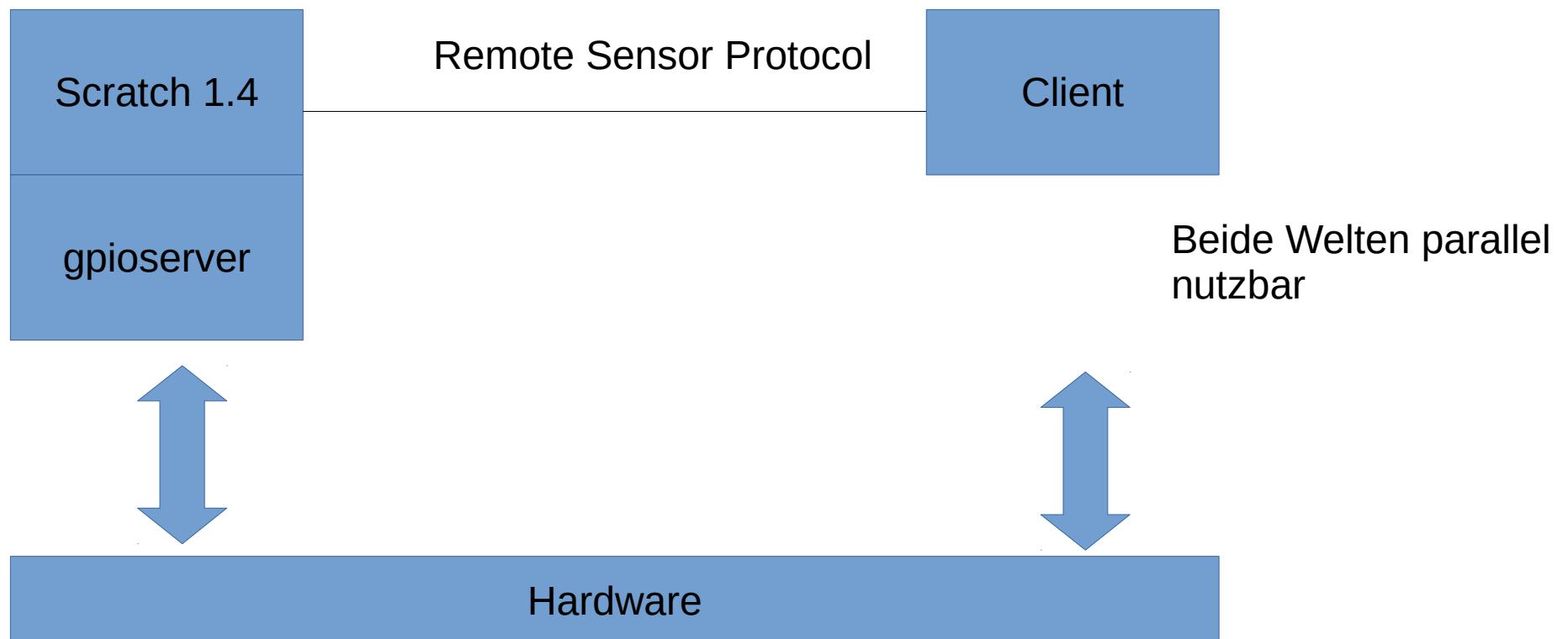
# Client Programme mit Scratch

Beispiele für Client-Programme

- scratchGPIO
- **scratchClient**
- scratchpy API



# 'gpioserver' zur Hardwareansteuerung



# ScratchClient

- „hardware abstraction“  
Logische Namen für Peripherie
- Skalierungen, Linearisierungen, komplexe Devices
- Adapter -orientiert und dadurch einfach erweiterbar.
- Für die Anwendung in der Schule entwickelt mit passenden Konfigurationen.

# Pro and Con

## gpioserver

- + no additional installations
- limited support for cards, devices
- + foundation supported
- limited development support

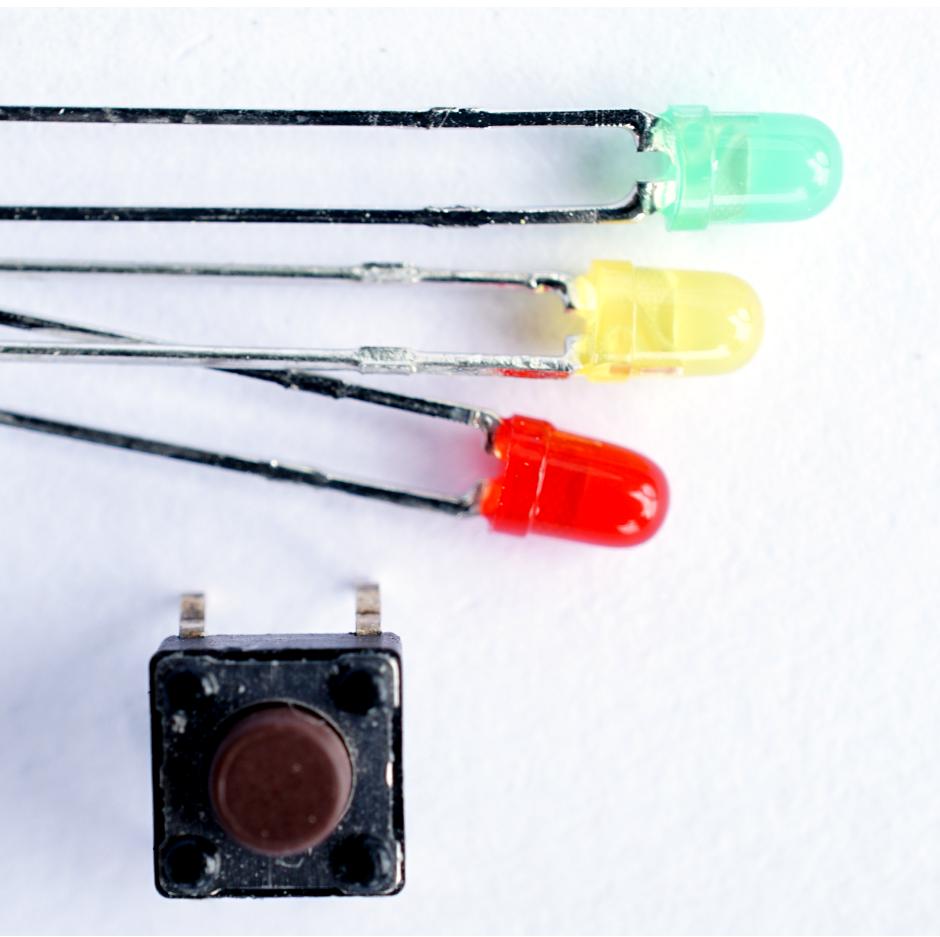
## scratchClient

- +/- additional installation needed
- +/- config files, preconfigured setups possible
- + monitoring
- + extensible, python based

# Workshop

## Ansteuerung LED mit Taster

- einmal mit gpioserver
- einmal mit scratchClient



# Zeitplan

10 min Einleitung

10 min Hardware Aufbau

30 min gpioServer

40 min scratchClient

10 min Aufräumen  
Diskussion

110 min

Die Unterlagen sind auf dem Desktop des  
Raspberry Pi verfügbar.

# Weitere Informationen

ScratchClient: [heppg.de](http://heppg.de)

Raspberry pi: [raspberrypi.org](http://raspberrypi.org)

Scratch: [scratch.mit.edu](http://scratch.mit.edu)