WIZnet W5500 :: Ethernet Controller

th muda engineering

The WIZnet W5500 is a hardwired TCP/IP Ethernet controller integrating a full TCP/IP stack, 10/100 MAC/PHY, and 32 kB internal buffer memory. It supports up to 8 independent hardware sockets over a high-speed SPI interface (up to 80 MHz), with protocol support for TCP, UDP, IPv4, ICMP, ARP, IGMP, and PPPoE — making it well-suited for network connectivity in resource-constrained embedded systems.

This driver implements full TCP and UDP socket communication across all 8 sockets, validated against the device's maximum data rate with support for both 10 Mbps and 100 Mbps operating modes.

The software is architected with long-term maintainability, portability across MCU platforms, and adherence to high software quality standards as core design principles.

- ✅ Layered architecture with clear HAL abstraction
- ✅ Conforms to ISO C99 standard
- ✅ Portable across multiple MCU platforms
- ✅ Supports both RTOS and bare-metal environments
- ✅ CMake build system for scalable integration
- ✅ Seamless integration with GCC toolchain
- ✅ Statically analyzed for MISRA, CERT, and CWE compliance

Initialization Interface

```
w5500_result_t w5500_init( w5500_handle_t*, w5500_attr_t,
                           w5500_int_callback )
```

Configuration Interface

```
w5500_result_t w5500_get_device_info( w5500_handle_t*, ... )
w5500_result_t w5500_set_mode( w5500_handle_t*, ... )
```

Socket Management Interface

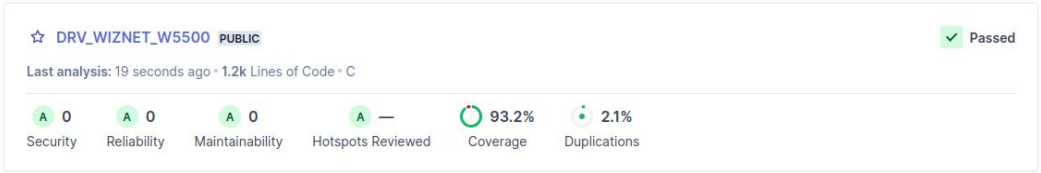
```
w5500_result_t w5500_create_socket( w5500_handle_t*, ... )
w5500_result_t w5500_open_socket( w5500_handle_t*, ... )
w5500_result_t w5500_close_socket( w5500_handle_t*, ... )
w5500_socket_status_t w5500_get_socket_status( w5500_handle_t*, ... )
```

Write Interface

```
w5500_result_t w5500_write( w5500_handle_t*, ... )
```

Data Retrieval Interface

```
w5500_result_t w5500_read( w5500_handle_t*, ... )
```



Communication Interface:

SPI