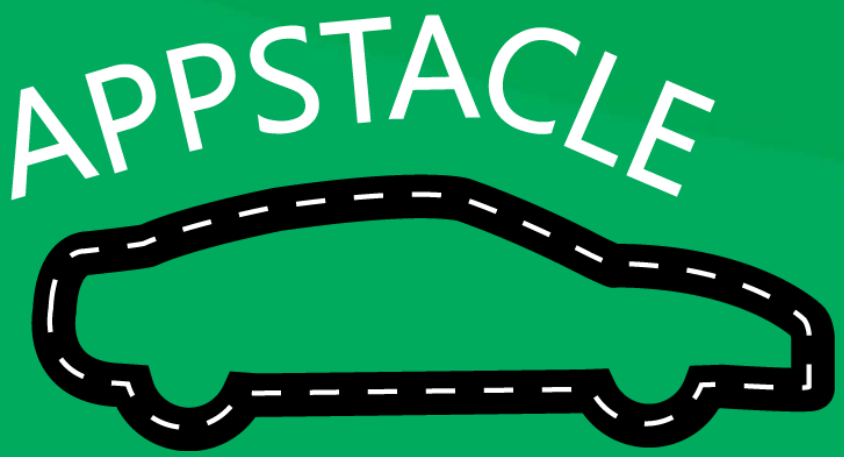


open standard
APplication
Platform for carS
and TrAnsportation
vehiCLEs

Appstacle Project Board

taskit

ITEA 3

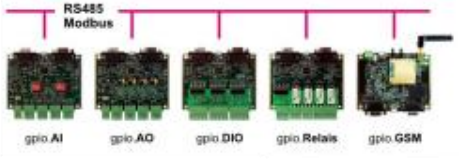
University of Oulu

Portfolio of taskit

taskit

- CPU Modules
- Gateways
- HMI
- Automation
- And more...

GPiO.NET
flexible automation

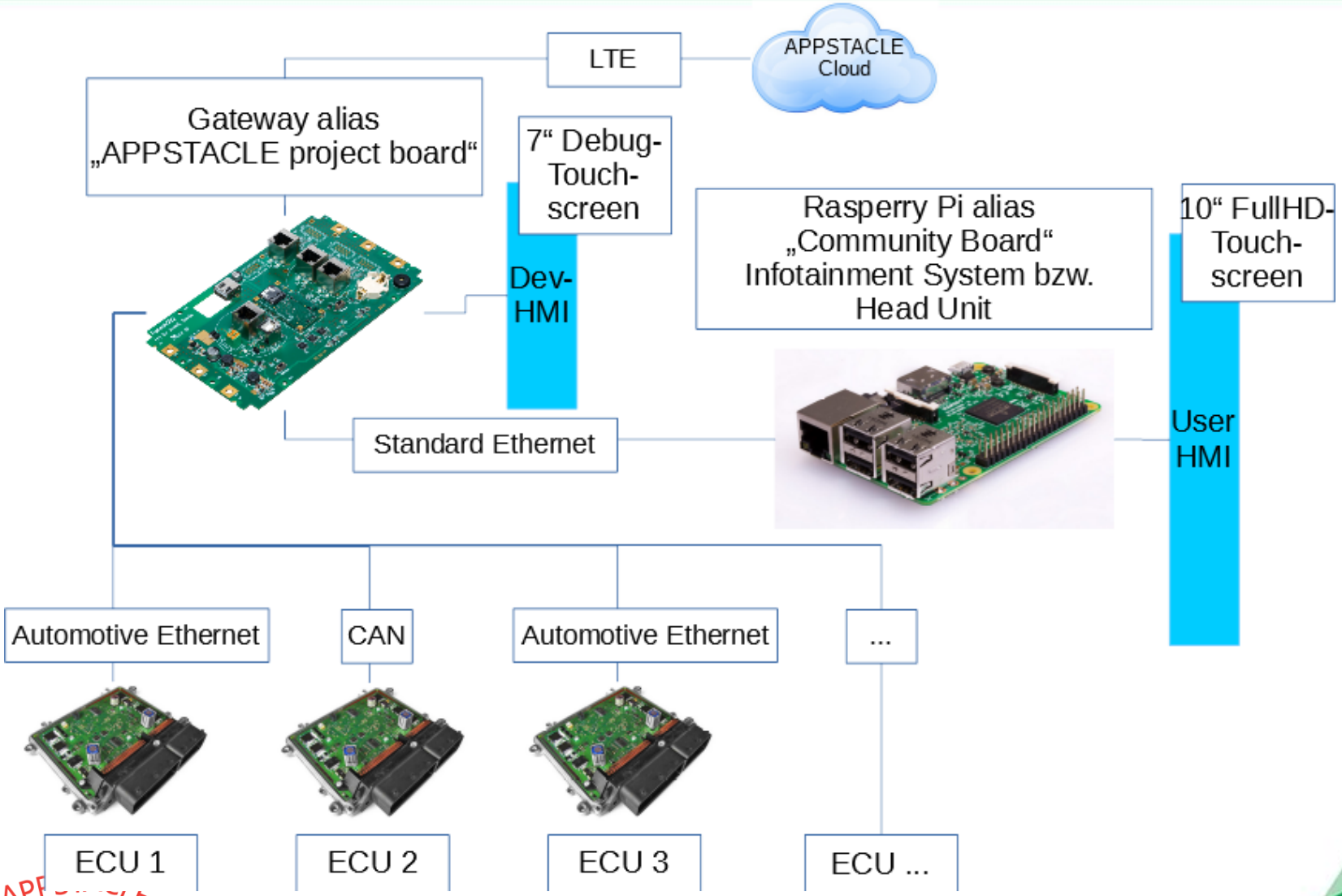


APPSTACLE

Introduction

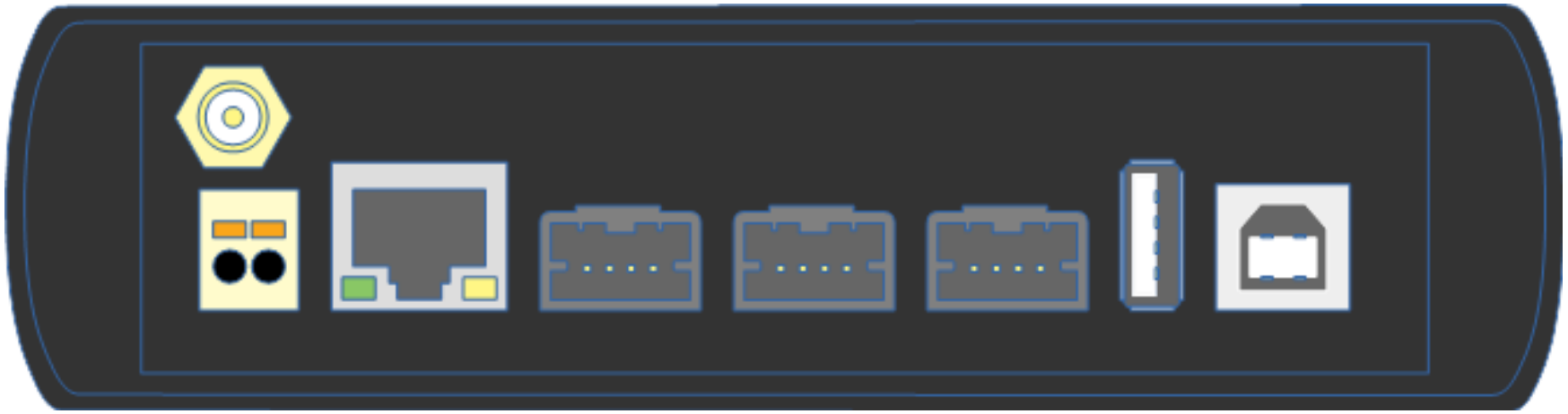
- The main task of the distinct APPSTACLE project board consists in carrying out the connection between the central CPU and the Cloud via LTE and, later on, 5G. This involves all necessary software protocols and security checks. Apart from that, the Gateway serves as the central router for various in-vehicle fieldbus interfaces which may include Automotive Ethernet, CAN, CAN-FD, LIN, (MOST, Flexray). Furthermore, ex-vehicle interfaces, e.g. ITS-G5, may be connected via USB or Ethernet.
- The APPSTACLE Project board may include a Human-Machine-Interface (HMI). This may consist of a TFT (e.g. 7") and a capacitive touchscreen.
- The APPSTACLE project board should provide one or more Automotive Ethernet (e.g. IEEE 802.3 100Base-T1) interfaces.
- The APPSTACLE project board should provide one or more Controller Area Network (CAN) interfaces.

APPSTACLE Hardware Topology



APPSTACLE Gateway Front

GPS-Antenna
SMA Receptacle



Vin = 8..28V
Terminal Block 3.5mm
e.g. Wago Picomax

Ethernet
100Base-T

3x Automotive Ethernet
100MBit/s
Molex Mini-50 Header

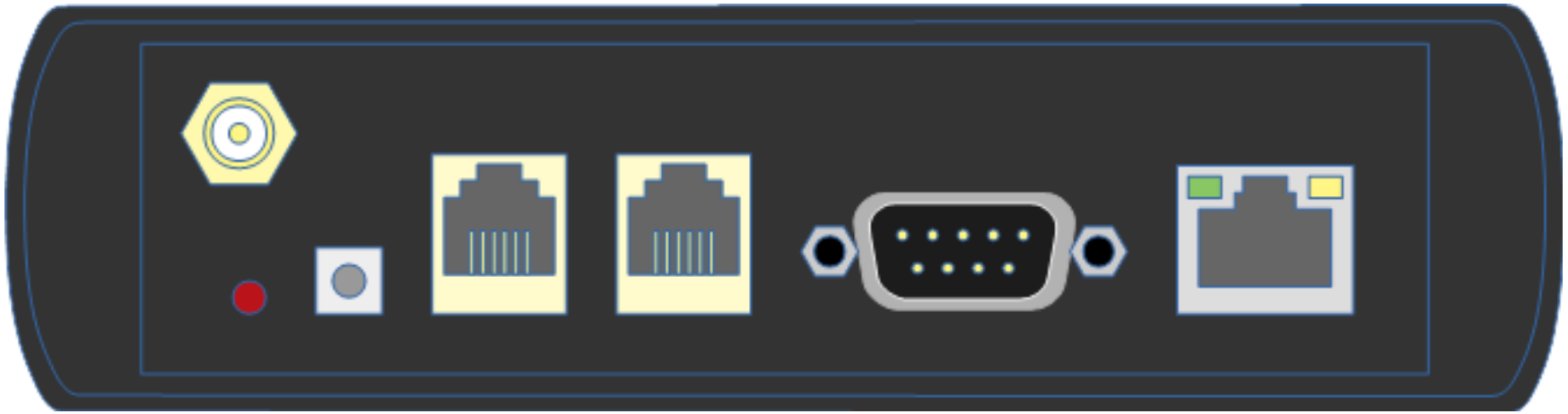
USB 2.0 480MBit/s
Host and Device

APPSTACLE Gateway Back

LTE-Antenna
SMA Receptacle

LVTTL I/Os:
UART, I²C,
SPI, GPIO
2x RJ12

RS485 3MBit/s
Field Bus

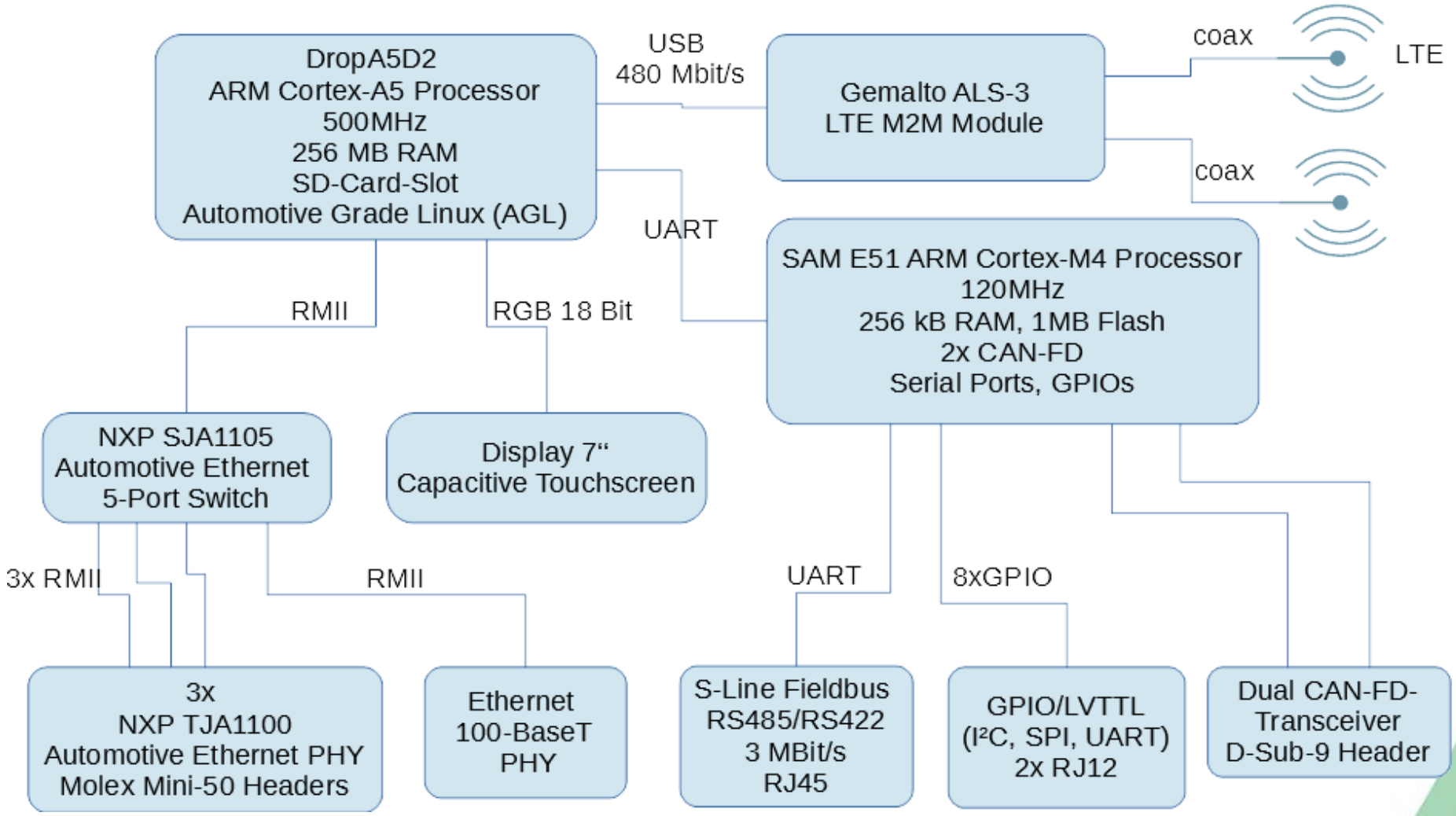


Status LED

Push-Button, for
arbitrary use

2x CAN-Bus
DSUB-9 Header

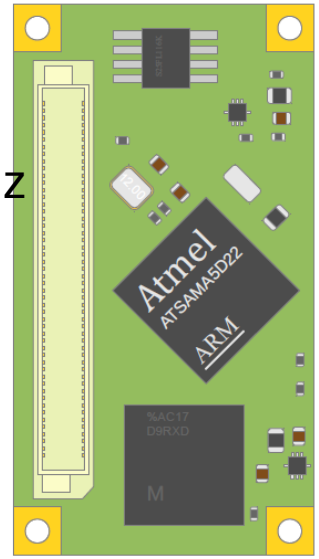
Block Diagram

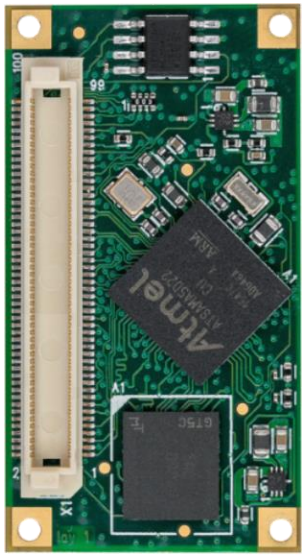


Backup

Thank you.

DropA5D2

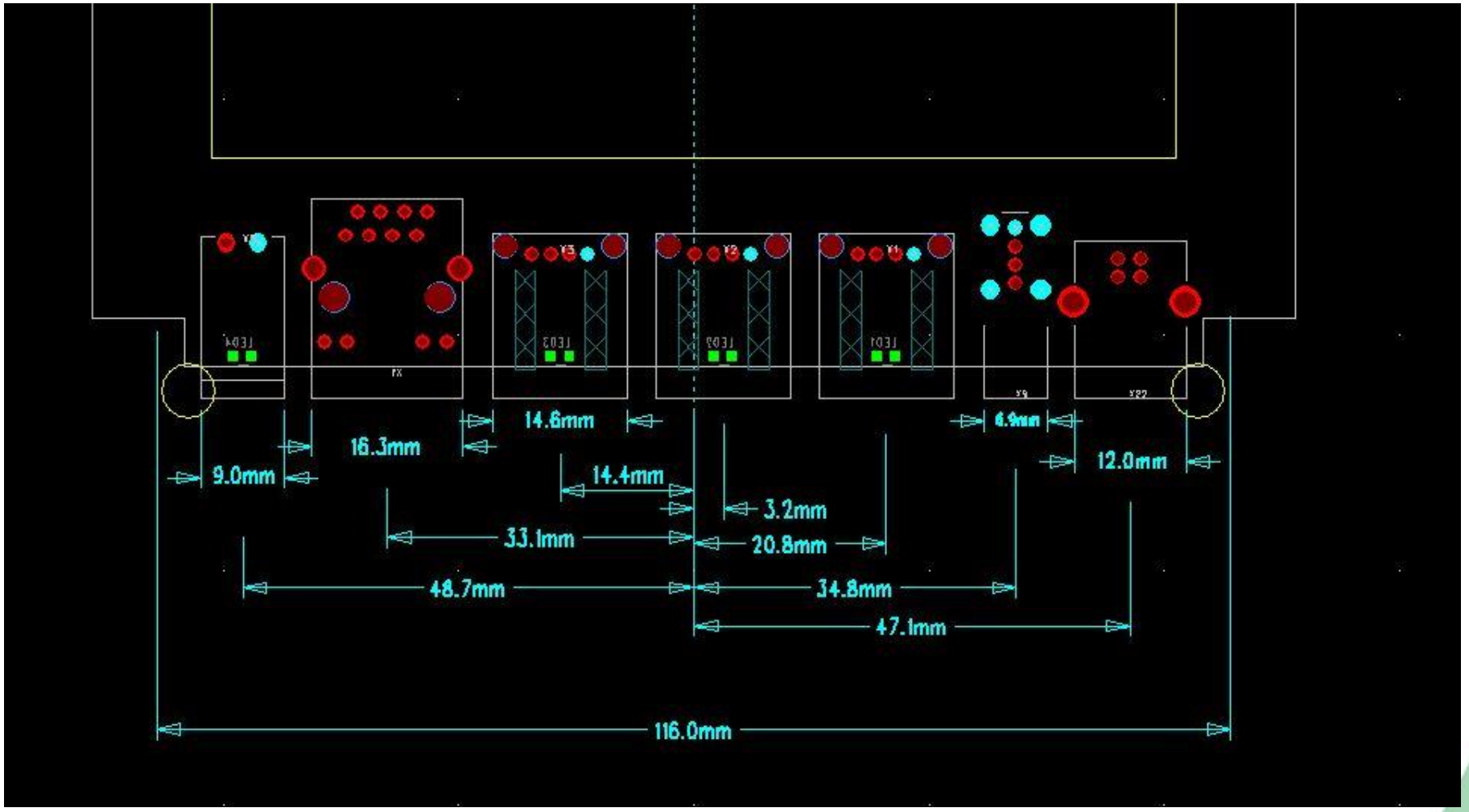




Technical description:

- Atmel ATSAMA5D22 Emb. Processor @500 MHz
- ARM Cortex-A5 Core
- Tamper Detection
- Memory Management Unit (MMU)
- Secure Data Storage
- ARM V7-A Thumb2 Instruction Set.
- 64kB Level-1 Cache (32kB Instruction, 32kB Data)
- 128kB Level-2 Cache (available also for general use)
- Separated 16-Bit DDR-RAM Bus and 16-Bit EBI (External Bus Interface)
- NEON™ Media Processing Engine, including Vector Floating Point Unit (VFPv4)
- Jazelle (direct Bytecode Execution) Java Acceleration
- ARM TrustZone® Advanced Security Functions

Dimensional Drawing of Connectors I



Dimensional Drawing of Connectors II