CAN bus on LogicMachine and CAN bus extensions

Improvements in comparison with KNX and Modbus

embedded systems

- KNX is very good technology by in our opinion there are several drawbacks:

- It’s slow (TP1)
- It’s too expensive in some projects
- It’s not flexible (no auto addressing, no device discovery)

CAN bus advantages

- **Decentralized** system (same as KNX)

- CAN bus has the same feature as two-wire systems. It can work as **peer-to-peer** and as **master-slave**. Simultaneously.

- Bandwidth depends on the distance:

  - up to **5 Km** with bit-rate same as KNX (9600)

  - a regular shorter line bandwidth which we use is >10x more than KNX (so much less delays) **100kB/s**.

- We integrated **programming button**:
  - To program individual address
  - To discover devices
- In discovery mode you can find out which kind of device is this (Hardware ID, Software ID)

- There are two addressing – **peer-to-peer and KNX addressing**

- You can subscribe to both address types, LogicMachine acts as a bridge with which you subscribe

- Internally we **support all regular KNX data types**. It is fully compatible on data level

- When you write in LM to some KNX grp address which is mapped to CAN bus object, its is transmitted into CAN smoothly

- In comparison with regular serial devices, it allows not to have one point of failure

- There is no polling as it is in ModBus, so everything is executed in real-time

Auto-comissioning

- If the CAN device fails, you simply replace it, set same ID and update subscriptions. All objects will assign automatically

Usability and stability of CAN bus

- We use same WAGO connectors as in KNX, just different color (white/yellow)

- It’s easy to discover and flash CAN devices

- DHCP-server like addressing

- You can use same object addressing as in KNX e.g. 1/1/1 as well as peer-to-peer addressing

- We removed all KNX disadvantages but kept familiar environment with all base KNX data-types

- **Full diagnostics**
  - On each interface/device there is **error counter** both receive/send telegrams
- **Watchdog** built in(can check status of each device)
- There is also an option that CAN continues to work even when one of two wires has been disconnected

- CAN is **time and harsh environment proven** technology

- CAN is popular fieldbus system in space, automotive, aerospace, railway industries

CAN bus products by EMBS

- The idea is to have LM5 (4DIN and 6DIN Reactor) devices with both KNX and CAN bus (or optionally only CAN)
- Several CAN bus stand-alone devices to extend installation in cost-effective way:

Product code	Product name	CAN bus	RS-485	DALI	1-wire	CEC	EnOcean 868MHz	Programmable Analog input or digital output	Analog inputs	0-10V outputs	0-20mA	PT1000 inputs	Relay 10A	Relay 2A	TRIAC 220V relays	Security LOOP	Size
UIO16-CAN	**CAN IO Extension** with 16 x Analog Inputs / Digital outputs	x						16									3DIN
CAN-8R	**CAN Relay Extension** with 8 x 10A relays	x											8				3DIN
CAN-D	**CAN Dimmer Extension** with 2 x DALI, 1 x 1-wire, 8 x Analog inputs / Digital outputs, 3 x 0-10V outputs, 1 x 0-20mA output	x		2	1			8		3	1						6DIN
CAN-RS	**CAN Security Extension** with DALI, 1-wire, 8 x AI, 2 x AO, 2 x PT1000, 2 x 10A relays, 3 x 2A relays	x			1				8	2		2	2	3	2	3	6DIN

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