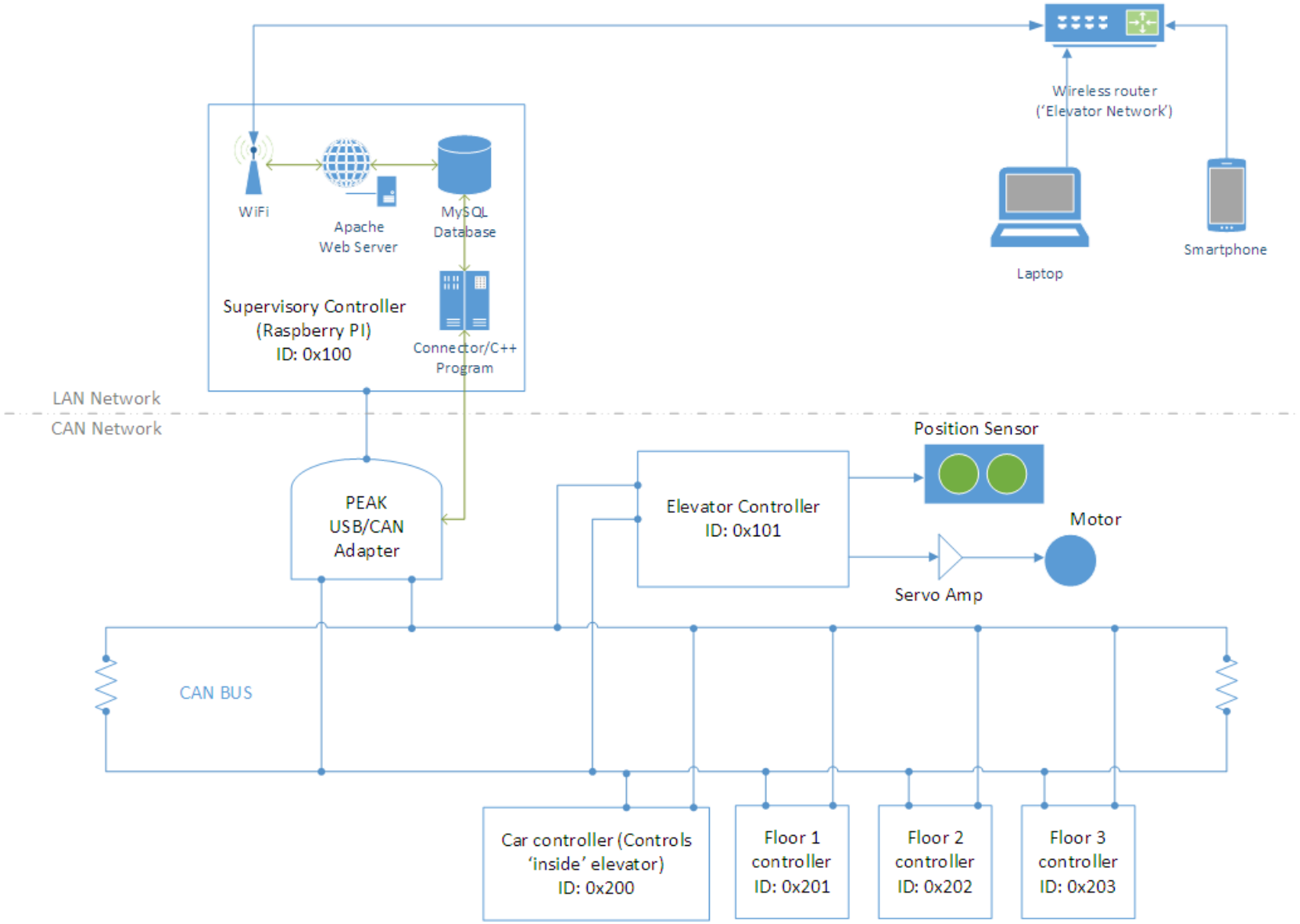
Elevator System Overview



Supervisory Controller (CAN ID: 0x100)

- Raspberry PI based
- Bridges LAN and CAN network via PEAK USB/CAN adapter
- Receives its commands (floor requests) from Floor 1, 2 & 3 controllers, Car controller and Web server
- Sends commands to Elevator controller
- Implements a state machine

Elevator Controller (CAN ID 0x101)

- Accepts commands only from the Supervisory Controller (ID of message must be 0x100)
- Controls Elevator Car position via servo amp
- Reports Elevator car floor state (position) on CAN network based on inputs from the position sensor

Car Controller (CAN ID 0x200)

- Sends floor call request (and possibly door state) on CAN network to the Supervisory Controller
- Receives floor state on CAN network

Floor Controllers (CAN ID 0x201, 0x202 and 0x203)

- Send floor call requests over CAN network to the Supervisory Controller
- Receives floor state on CAN network

Common CAN Protocol Message Layout											
CAN ID (Hex)	Transmitter	Recipient(s)	DLC	Byte 0							
				7	6	5	4	3	2	1	0
0x100	SC	EC	1						SC_Enable	SC_FloorReq	
0x101	EC	ALL	1						EC_Status	EC_Pos	
0x200	CC	SC	1							CC_FloorReq	
0x201	F1	SC	1								F1_FloorReq
0x202	F2	SC	1								F2_FloorReq
0x203	F3	SC	1								F3_FloorReq

Legend

SC	*Supervisory Controller*
EC	*Elevator Controller*
CC	*Car Controller*
F1	*Floor 1 Controller*
F2	*Floor 2 Controller*
F3	*Floor 3 Controller*

Variable	value	Comment	# bits
SC_Enable	0 = disable 1 = enable	SC can enable or disable elevator	1
SC_FloorReq	1 = Floor 1 2 = Floor 2 3 = Floor 3	SC command to EC to request a specific floor	2
EC_Status	0 = disable 1 = enable	EC reports its state (enabled / disabled) to SC	1
EC_Pos	0 = moving 1 = Floor 1 2 = Floor 2 3 = Floor 3	EC report current floor number of the car to all modules	2
CC_FloorReq	1 = Floor 1 2 = Floor 2 3 = Floor 3	Car controller requests floor number	2
F1_FloorReq	1 = Request	Floor 1 requests elevator car	1
F2_FloorReq	1 = Request	Floor 2 requests elevator car	1
F3_FloorReq	1 = Request	Floor 3 requests elevator car	1

Examples												Message value	
CAN ID (Hex)	Transmitter	Recipient(s)	DLC	Byte 0									
				7	6	5	4	3	2	1	0	Binary	Hex
0x100	SC	EC	1	0	0	0	0	0	1	1		b00000101	0x05
0x100	SC	EC	1	0	0	0	0	0	1	2		b00000110	0x06
0x100	SC	EC	1	0	0	0	0	0	1	3		b00000111	0x07
0x101	EC	ALL	1	0	0	0	0	0	1	1		b00000101	0x05
0x101	EC	ALL	1	0	0	0	0	0	1	2		b00000110	0x06
0x101	EC	ALL	1	0	0	0	0	0	1	3		b00000111	0x07
0x200	CC	SC	1	0	0	0	0	0	1	1		b00000101	0x05
0x200	CC	SC	1	0	0	0	0	0	1	2		b00000110	0x06
0x200	CC	SC	1	0	0	0	0	0	1	3		b00000111	0x07
0x200	CC	SC	1	0	0	0	0	0	0	1		b00000001	0x01
0x200	CC	SC	1	0	0	0	0	0	0	2		b00000010	0x02
0x200	CC	SC	1	0	0	0	0	0	0	3		b00000011	0x03
0x201	F1	SC	1	0	0	0	0	0	0	0	1	b00000001	0x01
0x202	F2	SC	1	0	0	0	0	0	0	0	1	b00000001	0x01
0x203	F3	SC	1	0	0	0	0	0	0	0	1	b00000001	0x01

Note: Values in blue are transmitted over CAN network