

# BOM Autonomous Platform Generation 4

**TOTAL PRICE SEK: 16139,3**

| Part Name | Quantity | Area of Use | Price (SEK) |
|-----------|----------|-------------|-------------|
|-----------|----------|-------------|-------------|

## CENTRAL MASTER COMPUTING UNIT

|   |   |  |      |
|---|---|--|------|
| Raspberry Pi 4 Starter Kit 4 GB                                   | 1 | Raspberry Pi 4b for Low Level Hardware interface   | 1890 |
| LM2596 DC-DC converter  | 1 | Power components on AP4.<br>In voltage 3.2-46<br>Output voltage 1.25 - 30<br>3A          | 25   |
| DB9 BREAKOUT BOARD Male   | 1 | HW Node standardised DB 9 can bus connector  | 66   |
| DIR-842-V2 Wifi Router  | 1 | Wifi router / switch with 1000 MB/s ports  | 499  |
| RS485 CAN HAT Raspberry Pi  | 1 | Prebuilt CAN shield for raspberry Pi   | 203  |
| Raspberry Pi 4 7 mm heatsink                                      | 1 | Low profile raspberry pi cooling heatsink and fan.                                       | 120  |
| Axial Fan DC 40x40x10mm 12V                                       | 1 | Cool Down hardware interface   | 57   |
| Xbox controller   | 1 | Wireless controller and USB reciever for remote control of ap4                           | 899  |
| 7inch IPS Capacitive Touch Screen 1024x600 Resolution LCD Display | 1 | Display for hardware interface raspberry Pi 4, System monitoring whilst running platform | 900  |

## Power Module

|                                     |   |  |        |
|-------------------------------------|---|--|--------|
| XT60 Male                           | 1 | Connecting power to various components on autonomous platform. Max 60 Amp.                           | 21     |
| XT60 Female                         | 2 | Connecting power to various components on autonomous platform.                                       | 40     |
| Current ant voltage reading sensors | 1 | Possibility to measure voltage of AP4 and current during runtime programatically                     | 120    |
| Emergency stop                      | 2 | Emergency stop if something unexpected happens, breaks power to all components except ninebot segway | 274,52 |
| Led Acid Battery                    | 1 | 12 V, 30 Ah  | 799    |
| Battery Charger                     | 1 | Led Acid Battery Charger IP68, 12 V, 8 A   | 649    |
| Automotive grad fuse                | 1 | Blow fuse if ftoo much power is drawn from battery   | 25     |
| Fuse Holder                         | 1 | Connects fuse to battery circuit   | 33     |
| C14 Contact                         | 1 | Intag, C14, 250V, Schurter, till batterimodulen  | 126    |
| Din rail mounted PSU                | 1 | 90% Efficiency, 12V, 10A, 120W   | 875    |
| Fuse connector for C14 outlet       | 1 |  | 42     |
|                                     |   |  |        |
|                                     |   |  |        |
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## Generic ECU base Components

Quantity inside brackets are required for ONE ECU

|                                |      |   |       |
|--------------------------------|------|---|-------|
| LM2596 DC-DC converter         | 3(2) | Power components on AP4.<br>In voltage 3.2-46<br>Output voltage 1.25 - 30<br>3A                                 | 110   |
| XT60 Male                      | 1    | Connecting power to various components on autonomous platform. Max 60 Amp. Package of 20                        | 209   |
| XT60 Female                    | 1    | Connecting power to various components on autonomous platform. Max 60 Amp- Package of 20.                       | 199   |
| XT60 splitter                  | (1)5 | Parallell wired M-M to M Y connector for XT60 contact. Enables one to parallell wire new components on platform | 550   |
| Jumper wire F-F                | 6    | Jumper wires bradboard, Female to Female, pack of 10  | 72    |
| Jumper wire M-M                | 6    | Jumper wire breadboard, Male to Male, pack of 10  | 78    |
| Jumper wire M-F                | 6    | Jumper wire breadboard, Male to Female, pack of 10  | 78    |
| DB9 BREAKOUT BOARD Male        | 9    | HW Node standardised DB 9 can bus connector   | 596   |
| STM32 bluepill                 |      | Ersätta dem stm32 bluepillsen vi tagit från infotivs inventarier<br>OBS köp 5 packet                            | 490   |
| MCP2515 can-bus modul          | 5    | Ersätta dem mcp2515 korten vi tagit från infotiv  | 151   |
| Flätad kabel 4 x 0.14 mm²      | 1    | Ihophäftade kablar, gör de mer neat när man drar kablar inuti HW noden. 10 Meter                                | 89    |
| GPIO-staplingslist 2x20        | 6    | Connect sensors to HW Node  | 222   |
| Logic Level Converter          | 5    | Converts 5v logic levels to 3.3v logic level<br>Used to interface stm32 bluepill (3v) to 5V CAN module          | 160   |
| Axial Fan DC 40x40x10mm 12V    | 4    | Cool down each ECU  | 228   |
| LED röd                        | 25   | Show ECU power status   | 42,25 |
| LED grön                       | 25   | Show node software status   | 42,25 |
| Automotive grad fuse           | 5    | Blow fuse if too much power is drawn from battery   | 165   |
| Fuse Holder                    | 5    | Connects fuse to battery circuit  | 125   |
| ST-link v2                     |      | Program stm32f103c8t6 Bluepill microcontroller  |       |
| Jumping wire crimping kit with | 1    | Kit med crimp housings och hankontakter (inte hittat hankontakter på infotiv?)                                  | 112   |
|                                |      |   |       |
|                                |      |   |       |

## SPCU Components

|                                     |   |  |      |
|-------------------------------------|---|--|------|
| Digital to Analog Converter MCP4725 | 2 | Circuit to send analog voltages to gokart pedals | 120  |
| Sabertooth 25x2 Motor driver        | 1 | Drives the dc-dc motor                           | 1300 |

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| Sabertooth Kangaroo x2 Motion Controller | 1        | Circuitboard motion controller board daughterboard to sabertooth<br>-Send positional command through serial to it<br>-connect EMG49 Motor Hal sensors to it, and two endstop switches and it will configure itself | 270         |
| Microswitch 440 mN                       | 2        | Microswitch to detect steering maximum and minimum limits  | 30          |
| IR Speed sensors                         | 4        | Speed sensors front and back wheels  | 164         |
| emg49 dc-dc motor with 50-1 gearbox      | 1        | DC-DC motor to controll the steering wheel   |             |
| EMG49 mounting bracket                   | 1        | mounting L bracket for motor   |             |
| EMB49 mounting bracket holder            |          | See AP3 documentation for dimensions, leftover component was used on AP4   |             |
|  |          |  |             |

## Mounting Hardware & Components

|                      |   |  |        |
|----------------------|---|--|--------|
| Screw m6x50mm        | 1 | Insexskruv M6 x 50, rostfri A2, 10 st. | 60     |
| Angled Steel bracket | 6 |  | 59,4   |
| threadscrew          | 1 |  | 159    |
| Screw M5x35 mm       | 1 |  | 40     |
| Screw m3x10          | 2 | set of 100 screws                      | 130    |
| Screw m3x16          | 2 | set of 100 screws                      | 130    |
| Screw m4x10          | 2 | set of 100 screws                      | 220    |
| Screw m4x16          | 2 | set of 100 screws                      |        |
| nut M4               | 4 | sets of 100 nuts                       | 260    |
| nut M3               | 4 | sets of 100 nuts                       | 104,88 |
|                      |   |  |        |

## Wire Management

|                        |   |                          |     |
|------------------------|---|--------------------------|-----|
| Sprial Wire Tube, 10mm | 5 | Wrap around loose cables | 150 |
| Sprial Wire Tube, 23mm | 5 | Wrap around loose cables | 300 |
|                        |   |                          |     |

## List of wires

|                          |  |  |  |
|--------------------------|--|--|--|
| Ethernet                 |  |  |  |
| DB9                      |  |  |  |
| 1.5 mm coppar wire red   |  |  |  |
| 1.5 mm coppar wire black |  |  |  |
|                          |  |  |  |
|                          |  |  |  |
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| Sensors                   |          |   |             |
| USB kamera, Logitech c920 | 1        | Front facing camera AP4.Documented to work well with existing ros2 camera packages! | 1260        |
|                           |          |   |             |