MUNIC

Devices Portfolio

C4 Dongles & TCUs Lineup

& specifications - extract

JANUARY 2025

For additional information, visit www.munic.io – or send a request to info@muni.io

C4 Dongles & TCUs Lineup – V8 generation

C4 Dongle OBD V8 & V8+

C4 Dongle OBD V8
catM with (2G fallback) variants

C4 Dongle OBD V8+
WiFi hotspot cat4 variants +
DoIP Variant *New*

C4 Dongle OBD V8+DoIP Max
Full Diagnostics

Available in 2025

C4 - V8 TCU Variants

C4 Lite V8

Available in 2025

C4 Max V8 & C4 Flex V8

***New* C4R Max V8**
(ruggedized variant of C4Max V8)

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Company Information

Munic is a leading manufacturer of Vehicle Connected Devices and a Vehicle Data & Services Provider. Leveraging the power of connectivity and vehicle data, Munic solutions combine in-vehicle and cloud-based technologies with artificial intelligence.

For decades, the automotive industry has been operating without any access to vehicle-data, due to a lack of connectivity and vehicle data processing technologies. For all the automotive industry stakeholders, access to vehicle data is essential to prepare for the big changes affecting this industry globally, by leveraging vehicle-data in existing services or developing new services and features. Munic is disrupting this industry that is projected to reach between 450 and 750 billion USD worldwide by 2030, by offering the only universal vehicle data access and processing platform. Based on 2 major technologies: in-vehicle terminals (mainly OBD Dongles) powered by Munic Edge computing platform, and AI Platform, Munic.io, that is leveraging the power of data science and machine learning for vehicle data processing, Munic is the enabler of a large range of innovative services.

Munic was established in 2002, with headquarters in Paris area, France and offices in the US and China.

Terminals

Munic offers 2 types of terminals:

- OBD dongles, the C4 V8 and C4 V8+ including the **NEW DoIP V8+**
- Hard-wired devices, the C4 Max, C4 Flex C4 lite, including the **NEW car sharing variant**

All terminals share the same core hardware and software platform:

- Dual processor: Application processor (cortex A7), and companion processor (microcontroller)
- Internal sensors: GNSS receiver and accelerometer (optional IMU)
- Cellular connectivity: LTE catM or cat4 with 2G or 3G fallback
- Vehicle communication interface (such as CAN, K-Line, J1708, J1939…)
- Power supply form Vehicle power, with internal backup battery
- Optional BT and WiFi

- OS Morpheus 3.X and Multistacks service, enabling multi brand vehicle data acquisition and analysis.

Devices are delivered with a high-end OS which controls the automatic behavior of the device:

- wake-up (or boot) on vehicle engine start or ignition, or trip start, idle (or power off) on engine stop or trip stop.
- Monitoring all sensors and data acquisition and data storage in the device
- Data transfer to Munic servers and push to clients' servers
- Device Self-check
- Device management and OTA
- Security management

Optionally Munic devices software can be modified and update OTA. Munic offers a complete suite of programming tools for Munic devices: StateMachine, MSP, Morpheus SDK,...

All devices are entirely designed in Munic offices in Paris and manufactured in China, by Asteelflash. All devices are 100% tested with Munic test bed operated by Asteelflash.

OBD Dongles

OBD Dongles are plug and play devices with simplest installation in vehicles. These devices are installed by plugging into the OBD connector, which also provides power and vehicle interface to the device. Radio antennas (cellular, GNSS, BT, WiFi) are internal.

Hardwired devices

C4Max, C4Flex and C4lite are hardwired to the vehicle power and desired signals. Those devices can monitor other signals than those present on the OBD connector such as : RS232, 1-wire, Lin, Digital outputs and inputs etc.
Those devices have either internal or external antennas.

C4RMax & C4RFlex are ruggedized & extended variants of C4Max & C4Flex: more I/Os including Ethernet, extended memory including SD Card, extended qualification and certification: IP67, IP69K, IK10, ISO 16750, MIL-STD-810 and SAE J1455.

C4 Max, Flex and Lite V8 specifications - extract

Available in 2025

C4Max/C4Flex w/ internal antennas (option)

Firmware	C4 Lite V8	C4 Flex V8	C4 Max V8	New C4 Max CS car sharing
Main processor + coprocessor	Cortex A7 / 1.3 GHz + dsPIC33 MCU (low level vehicle interface, pwr & sensors mngt) or equiv (Renesas/STM32)			
Main Processor Memory	Flash 512 or 256 Mbytes (depending on variant) / Ram 200 Mbytes			
Operating System	Morpheus 3.X OS based on Linux 4.X, w/ Munic Telematics Firmware & Edge Computing tools			
Modem	4G catM or cat 4 (with fallback)			
SIM Connector (3FF)	●			
eSIM (soldered SIM)	Option			
GNSS	GNSS 4 simultaneous constellations, A-GPS Long term ephemeris u-blox M10050-KB -167 dBm			
Cellular & GNSS Antennas	Internal	External (internal as an option)		
3D Accelerometer	±2g/±4g/±8g/±16g - 16-bit data output - 1 kHz sampling rate (up to 3 kHz)			
6D Accelerometer (IMU)	-	option		
Compass (3D Accelerometer + Magnetometer)	option	option		
Bluetooth 4.2	-	option	●	●
WiFi b/g/n	-	option	●	●
RS232	-	1 (RXD, TXD)	1 (RXD, TXD)	1 (RXD, TXD)
RS485	-	-	1 Shared with J1708 (*)	-
CAN High Speed	-	1	2	2
1-Wire	1	1	1	1
K-Line	-	-	1 (shared with LIN)	1
LIN	-	-	1 (shared with K-Line)	1
J1708	-	-	1 Shared with RS485 (*)	-
USB	1	1	1	1
Internal relays for immobilizer (Ignition Control) for car sharing	-	-	-	2
Digital Inputs	1	3	4	2
Active high (ex: ignition read)	by default	1	2	1
Active low (ex: panic button)	(option)	1	1	1
Tachograph input (Europe) active high or low, BOM option)	-	1	1	-
Digital outputs	1	2	2	2
Analog inputs	1	2	2	2
Internal battery temperature (NTC) reading	-	●		
Internal battery voltage reading	●			
Battery charge current reading	-	●		
PCB temperature reading	-	●		
Vehicle voltage reading	●			
Internal battery	270 mAh	450 mAh		
Low power modes – Idle BT & Cell. radio off	●			
Low power modes – Idle BT on	-	●		
Low power modes – Idle Cellular radio on	●			
Wake-up sources	Accelero. & Magneto. Power loss, Digital inputs, USB Pwr, Modem (Call, SMS) with PSM	Same + CAN activity Vehicle voltage analysis (crank)		
LED	1 x bicolor LED			
Overall dimensions (mm)	73*61*18	80.5*74*19		
External power supply	8 – 32V			
Load Dump protection	-	●		

*: production option

Design & specifications are subject to change without notice, please contact our sales for latest specifications

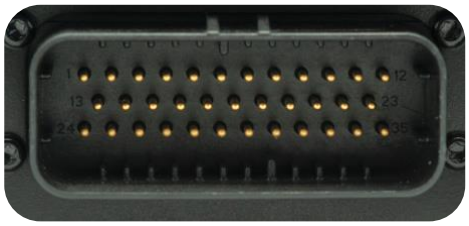
New C4R: ruggedized & extended variant of C4Max & C4Flex.

USB-C / SIM / SD Card

-40 / +85°C battery

Vent

Steel spacer



Ruggedized 35 Pins connector

LTE/GNSS/WiFi/Ethernet Connectors

Ruggedized & flexible

- **IP67 & IP 69K**
- **IK10 enclosure**
- **+/- 36V** short protection, **25K ESD** protection all connectors
- **ISO16750 - MIL-STD-810 SAE J1455** Qualification
- **Morpheus (Linux) OS**

C4R specifications – extract

C4R vs C4Max/C4Flex Main differences:

vs

- Larger, IK10 enclosure + resistant connectors
- IP 67 & IP69K
- Extended temperature range (incl. embeded battery)
- +/- 36V short protection + 25K ESD protection on all I/Os and interfaces
- Ethernet
- SD Card support
- Larger memory
- More I/Os
- Extended qualification : ISO 16750, MIL-STD-810 and SAE J1455

C4R exists with 2 ruggedized levels, and 2 connectors configurations (this makes 4 variants + options)

- C4RMax is a full IP67, extended temperature and shocks and vibration resistant (IK10)
- C4RFlex is IP54, and has lower ruggedization standards than C4RMax.

2 connector options for C4RFlex & C4RMax :

23 Pins connector & cellular antenna diversity	35 Pins connector single cellular antenna
	

C4RMax & C4RFlex - Comparison table

Feature	C4RFlex	C4RMax	
			Allocation of 12 pin >
Main processor + co-processor	Cortex A7 / 1.3 GHz + STM32 MCU		
Main Processor Memory	Flash 512 MB/ Ram 256 MB		
Operating System	Morpheus 3.X OS based on Linux 6.X, w/ Munic Telematics Firmware & Edge Computing tools		
Modem	4G cat1 or cat4 w/fallback		
SIM Connector	2FF		
eSIM (soldered SIM)	option		
GNSS	u-blox M10 - 167 dBm		
Cellular & GNSS Antennas	External (internal on demand)		
3D Accelerometer	±2g/±4g/±8g/±16g - 16-bit data output - 1 kHz sampling rate (up to 3 kHz)		
IMU	option		
Compass (3D Accelerometer + Magnetometer)	option		
Bluetooth 5	1 (BT 5)		
WiFi	1 (b/g/n/ac)		
RS232	2 (1 with RX/TX, 1 with RX/TX/RTS/CTS)		+2
RS485	1 Shared with J1708 (*)		
Ethernet 10/100BASE-TX	1 (M12 connector)		
CAN High Speed (CAN-FD)	2		
1-Wire	1		
J1708	1 Shared with RS485 (*)		
USB	1		
Digital Inputs	4		+4
Active high (can be used as ignition read)	2		
Active low (can be used as panic button)	1		
Tachograph in (EUR) active high or low, (BOM)	1		
Micro SD Card	1		
Digital outputs	2		+2
Analog inputs	2		+2
Internal battery Temp (NTC) read	•		
Internal battery voltage reading	•		
Battery charge current reading	•		
PCB temperature reading	•		
Vehicle voltage reading	•		
Internal battery (-20°C/+70°C)	2500 mAh (5000 opt)	-	
Internal battery (-40°C/85°C)	-	1000 mAh (2000 opt)	
Low pwr modes – Idle BT & Cell. radio off	•		
Low pwr modes – Idle BT on	•		
Low pwr modes – Idle Cellular radio on	•		
Wake-up sources	CAN, Accelerometer & Magnetometer (when option selected), Power removal, Vehicle voltage analysis (crank), Digital inputs, USB power detection, Modem (Call, SMS) with PSM		
LED	2 x bicolor LEDs		
Overall dimensions (mm)	201 x 126 x 56 mm		
External power supply	8 – 32V		
Load Dump protection	•		
+/- 36V Short protection, 25K ESD protection on all interfaces	-	•	
Extended Protection grade	IP 54	IP67	
Ruggedized	+/- 36V Short protection / 25K ESD	IK 10 - ISO16750 / MIL-STD-810 and SAE J1455 +/- 36V ESD	

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C4 Dongle V8/V8+ specifications



Feature	C4 Dongle OBD V8	C4 Dongle OBD V8+	*New* C4 Dongle OBD V8+ DoIP
Main processor + coprocessor	Cortex A7 / 1.3 GHz (Arm V7, running Morpheus Linux based EDGE Computing OS) + dsPIC33 Microcontroller (low level vehicle bus interface, power management, sensors monitoring) or equivalent (Renesas / STM32)		
Application Processor Memory	Flash 256 Mbytes Ram 256 Mbytes	Flash 512 Mbytes Ram 256 Mbytes	
Modem	4G catM NA or EUR with 2G fallback. Other regions can be made available on demand.	4G cat4 EUR or NA. Other regions can be made available on demand.	
GPS/GNSS	GNSS 4 simultaneous constellations / including A-GPS Long term ephemeris u-blox M10050-KB -167 dBm		
3D Accelerometer	±2g/±4g/±8g/±16g - 16-bit data output 1 kHz sampling rate (up to 3 kHz) Anti-aliasing filter included 400Hz standard software output		
3D Gyroscope	Option. Full scale - ±125/±250/±500/±1000/±2000 °/sec (*) - 16 bit-rate value data output		
Bluetooth Server & Client	Option BT 4.2	Option BT 5.0	Option BT 4.2
WiFi Hotspot / Client	Option. 802.11 b/g/n (2.4GHz)	802.11 b/g/n/ac (2.4/5GHz)	Option. 802.11 b/g/n (2.4GHz)
OBD II / eOBD ***(Standard OBD protocols)***	CAN ISO 15765/15765-2 ISO 9141-2/ISO 14230 (KWP2000) SAE J1850 VPW SAE J1850 PWM + Single Wire CAN		
Dual CAN	Option 2nd CAN bus simultaneously		
Manufacturer OBD	Audi, BMW, Chrysler, Fiat Group, Ford, GM, Honda, Hyundai, Mercedes, Opel, PSA, Renault, Toyota, Volvo, VW, ... with pin switcher option – **additional vehicles with DoIP variant**		
Pin switcher (relays)	Option		
DoIP (ISO 13400)	-	-	Ethernet pin assignment options 1 and 2 with relays - Activation line on pin 8
Internal battery	450 mAh	270 mAh	
Wake-up sources	Vehicle battery voltage sense, RTC, Accelerometer, USB host detection, GSM, CAN, Power removal, and Bluetooth if option included		
LED	1 x bicolor LED	2 x bicolor LEDs	
Consumption @ 12V	Idle with wake-up on vehicle voltage cranks, USB and RTC: 850µA	Idle with wake-up on vehicle voltage cranks, USB and RTC : 1mA	
Operating temperature	-30°C / +65°C without battery		
Overall dimensions (mm)	61 x 27 x 50 48 x 27 x 50 without OBD connector	71 x 27 x 51 56 x 27 x 51 without OBD connector	
External power supply	8 – 18V or 8 – 30V depending on variant (to be specified at Order)		
USB	USB slave, master support w/ 1 limitation: no power source. micro-USB B – secured after production		
Antennas	GNSS, Cellular internal Option. WiFi / BT: internal	GNSS, Cellular (Main & diversity) internal, - WiFi / BT: internal	GNSS, Cellular (Main) internal, WiFi / BT: internal

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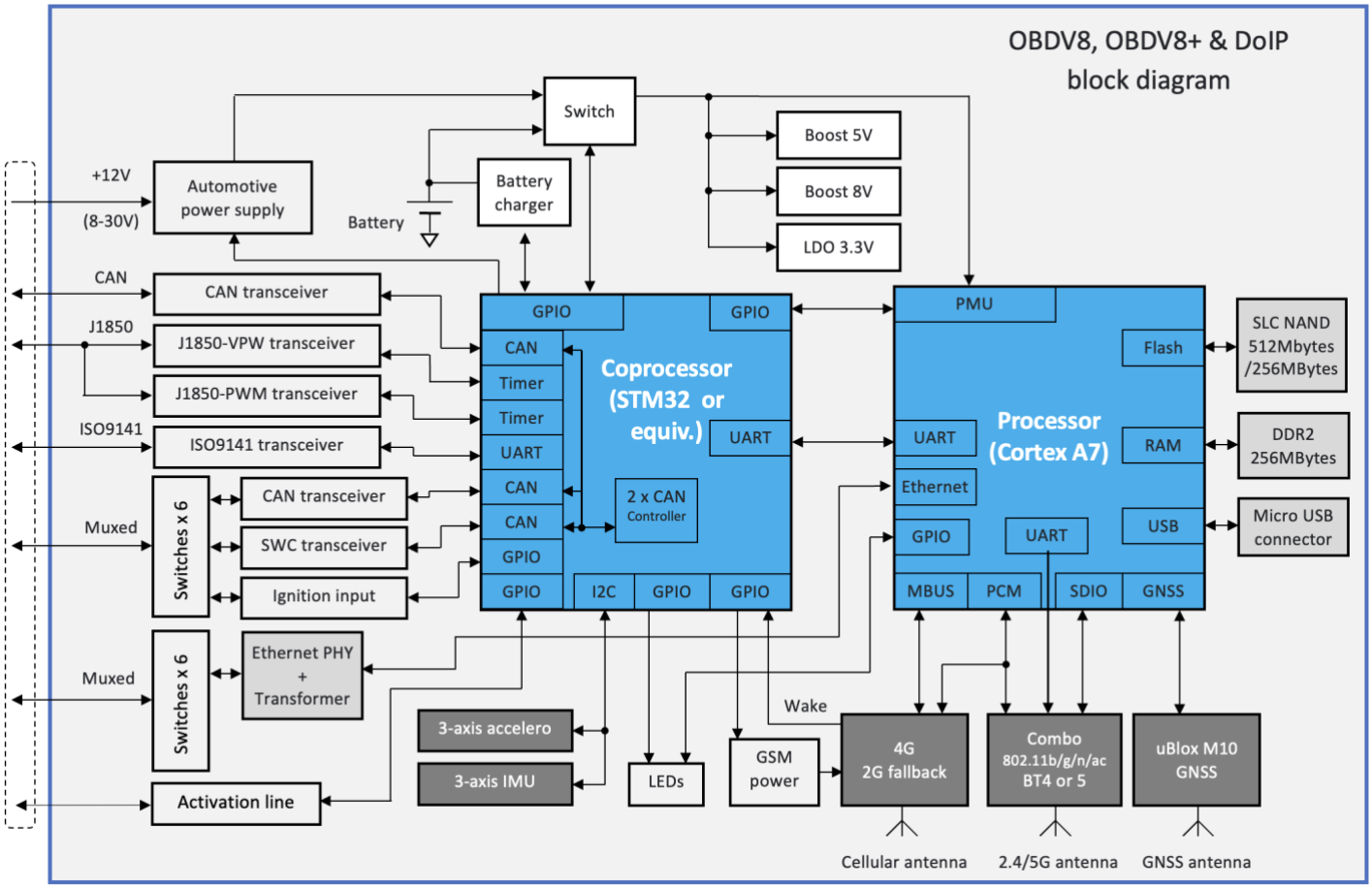
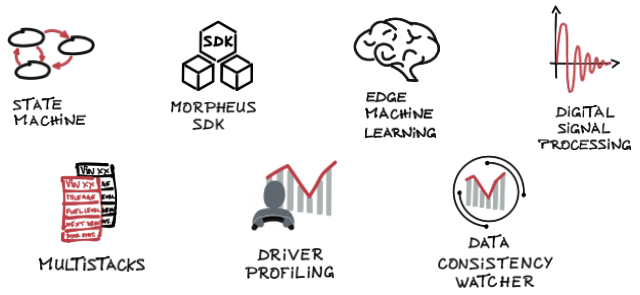
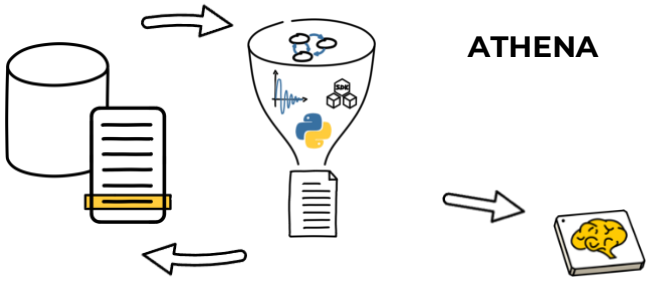
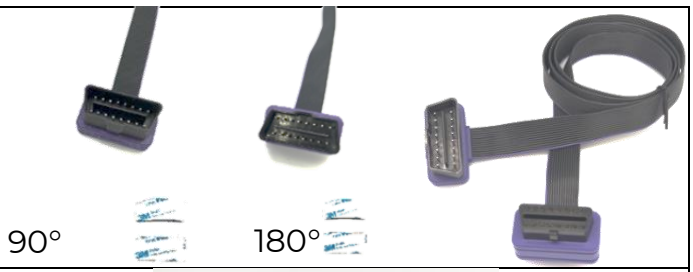
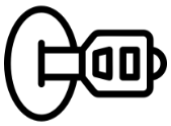
Block Diagram of C4 Dongle OBD V8 & V8+

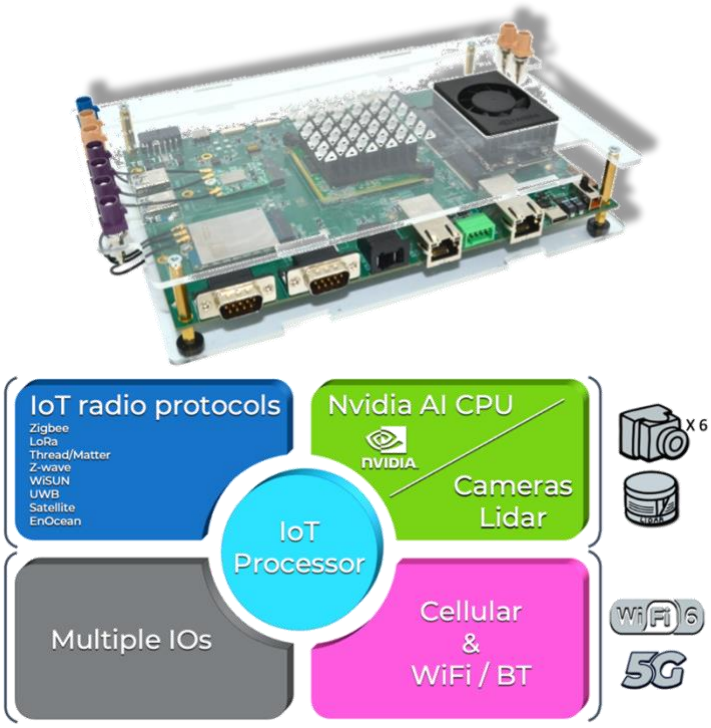


Development tools and accessories

Embedded Development Toolchain - Morpheus SDK: Java programming (and Rust on demand) - MSP: signal processing - Graphical Statemachine editor - Vehicle communication stack editor	
Data mining tools & Edge ML - Easy and fast access to your collected data - Data filtering and selection - Develop and test online algorithm on selected data sets - Deploy your algorithms in the field	
Dash cam - 2 channels (1920×1080/30FPS - 640×360/10FPS) - WiFi or wire connection - Controlled by Gateway	
Antenna for C4R	
Ruggedized antenna for C4R	
External Antenna for C4Max/Flex	
Y cable w/o and w/ bracket	

Relocation cable for C4 Dongle OBD	
Harness for C4Max/Flex	
35/23 pins harness for C4R	
SD Card	
Car Sharing controls New	 Door Lock/Unlock  Ignition Enable/Disable
RFID card reader	
iButton peripherals	iButton reader & iButton Tag, temperature sensor…
Alarm & Bluetooth peripherals	 
Tachograph interface	

UDK4IoT
Universal Hardware prototyping:
almost all image & 3D sensors, I/Os, radio, cellular interfaces + powerful processing & SW Edge Tools



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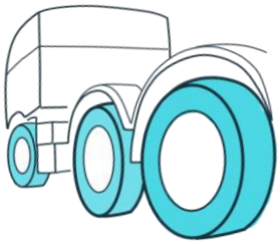
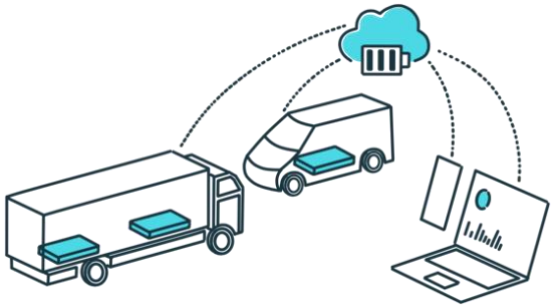
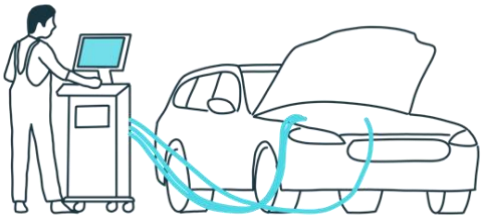
Innovative EKKO services available with Munic devices (extract)



AUTOMATIC TIRE WEAR MONITORING
partnership with ***MICHELIN***

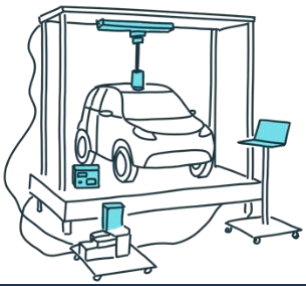


BATTERY IN THE CLOUD:
EV & ICE battery health - unique innovation and partnership with
leading global Battery experts

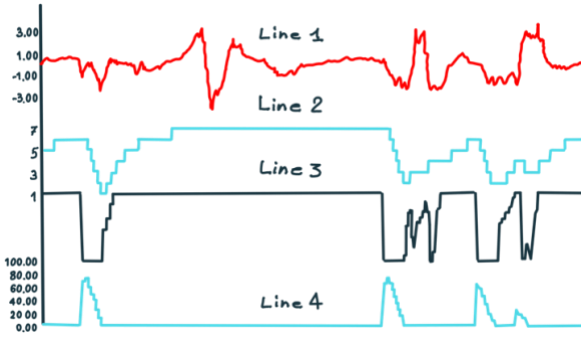


FULL REMOTE DIAGNOSTICS unique innovation & partnership with
leading Diagnostics providers

REMOTE DIAGNOSTICS HELPDESK
Leveraging 1000s of experts providing vehicle diagnostics expertise across all types of vehicles



Remote detection and characterization of shocks and vibrations, with wide sensitivity and energy range

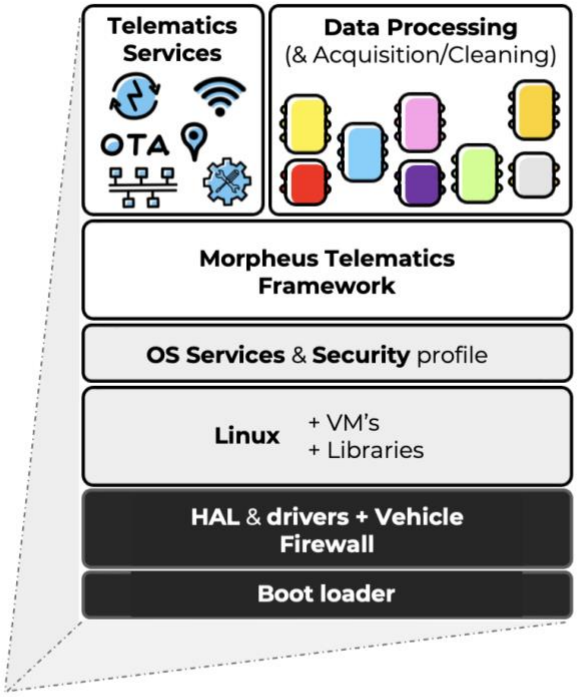


ADVANCED TELEMETRY
high performance remote monitoring of any signal. With optional compression, filtering, pre-processing at the edge before transmission in real-time. Conditional acquisition & transfer...

Morpheus Operating System embedded in Munic Devices

Includes below services

- Device management & monitoring
- OTA
- Power management
- Vehicle identification
- Vehicle communication
- Wireless communication
- Location Services
- Movement monitoring



Munic advanced Services + 3rd party Services

- Remote diagnostics
- EV battery wear
- Tire wear
- Prognostics
- Crash detection & analysis
- Trip monitoring
- Driver profiling
- Precise fuel tank calculation

Associated Cloud Services Suite