MiX | by POWERFLEET®

MiX 6000 MK2
Product Overview

Overview

The MiX 6000 is a high-end Fleet product that incorporates the latest market trends.

- The MiX 6000 range supports LTE Cat 4 with 2G/3G fallback, 3-Axis Accelerometer, WiFi, Bluetooth, 434 Short Range Device and GNSS.

Features	
Trip Data Recording	The following data is recorded: date and time, distance travelled, journey duration, vehicle speed, engine speed (RPM), journey departure and arrival time, driver name, driver ID and vehicle ID. Up to 12 of the existing input lines can be recorded as tacho data.
Driving Violations	The following standard violations are recorded: over speeding, over revving, green band driving, harsh braking, harsh acceleration, and excessive idling.
Driver Identification	Using the driver code-plug it is possible to know which drivers committed driving violations such as speeding, over revving, excessive idling, etc. as every trip or part there-of will have a driver associated with it. Make us of the standard FM blue plug.
Access Control	Through defining access control lists and installing and configuring the MiX 6000's starter interrupt feature.
Active Events	Be notified via email and/or text/SMS message, when selected standard or user-defined events occur, e.g. a cargo door opening in a no-go zone, or driver arrived at customer location.
Manage Locations	Add, delete or edit user-defined locations such as customer, supplier, no-go zone, etc.
Second-by-Second (Tacho) Data	The status of inputs such as speed and RPM is recorded every second. This provides valuable in-depth information for accident analysis.
Servicing and Licencing	Set reminders for your vehicle's next service or vehicle/driver licence expiry.
GNSS Data Recording	Essential information is recorded with every GPS and GLONASS tracking point, e.g. vehicle and driver ID, date and time, latitude and longitude, altitude, heading, velocity, number of satellites, etc.
Active and Passive Tracking	Track your vehicle movements in real-time using automated vehicle location (AVL) updates from the vehicle or by requesting the latest position using the MiX software. Replay routes taken on street level or satellite maps.
Inputs	The system offers various digital, analogue, frequency, tacho and ignition inputs as well as CAN/J1708 transceivers connected to the vehicle CAN bus. For detail, refer to the technical specifications below.
Communication Interfaces	LTE Cat 4 mobile communication, buzzer, status LEDs, 4x RS232 serial ports, K-Line, Bluetooth 4.2, WiFi and 434 MHz RF transceiver.
Accelerometer	To detect impact and movement
Outputs	8 x outputs are available to drive relays and switches
Tamper detection	Tamper detection when the housing is opened (covers removed). Shorting, cutting, or unplugging any of the external antennas can also be detected.
Internal Back up battery	An optional internal battery provides power for operation for at least 10 hours if the supply from the vehicle's battery is removed, or longer, depending on power saving.
SIM cards (dual)	Contains 2 x Nano (4FF) SIM slots

Product Variants

Part Number	Official Product Name	Description
U0042MT	MiX 6AMB-4G	MiX 6000 MK2 6AMB-4G Electronic Unit
U0043MT	MiX 6AMB-4G Kit	MiX 6000 MK2 6AMB-4G Kit; Contains Electronic Unit U0042MT, Main Harness MP22 (A0059MT), Code Plug CP2 (440FT0930), Code Plug Socket Harness with circlip (440FT0623), External LTE Antenna (A0049MT) and Combo RF antenna (A0050MT)
U0044MT	MiX 6AMB-4G-B	MiX 6000 MK2 6AMB-4G-B Electronic Unit with Backup Battery
U0045MT	MiX 6AMB-4G-B Kit	MiX 6000 MK2 6AMB-4G-B with Backup Battery Kit; Contains Electronic Unit U0044MT, Main Harness MP22 (A0059MT), Code Plug CP2 (440FT0930), Code Plug Socket Harness with circlip (440FT0623), External LTE Antenna (A0049MT) and Combo RF antenna (A0050MT)

SUPPLY

General

Real Time Clock (RTC)	Real time clock with independent 10 year battery back-up
3-Axis accelerometer	This 3-axis motion sensor has a dynamically user selectable full scales of ±2 g / ±4 g / ±8 g / ±16 g and it is capable of measuring accelerations with output data rates from 1 Hz to 5.3 kHz
Memory	FLASH: 2 MB internal, 16 MB external SRAM: 1 MB Backup SRAM: 4kB
Dimensions	L = 107 mm W = 135 mm (widest point without mounting bracket) H = 40 mm (highest point)
Weight	With battery: 0.2 kg Without battery: 0.15 kg
Tamper switch	Switch to detect the opening of unit
Buzzer	Sound alert
I/O Capabilities	8 x Digital / analogue inputs that have an input operating in either 0-5V or 0-38V range and can be utilised as slow frequency inputs) 4 x High frequency inputs (2 are configurable as analog inputs) 8 x positive drive outputs (4 in serial ports and 4 on other harnesses) 1 x ignition input 1 x RS232 port / J1708 / RS485 3 x RS232 2 x CAN interfaces 1 x K-line interface
Code plug interface	Standard FM code plug circuit with I2C-bus and 5V aux output (150 mA max) Intended for use with code plugs used to identify drivers, as well as other methods of driver identification
Ignition Detect	The ignition input is used only to monitor the vehicle's ignition line state, and can measure up to 38V. Disconnection of this wire can be detected with open-wire detect

Power Supply

Primary power supply	Rated voltage ($V_{nominal}$): 9 to 36 VDC

Current consumption (primary side)	**Max current drawn during operation:**
	< 150mA average, 2A peak, with 14V supply
	< 80mA average, 1A peak, with 28V supply
	Max current drawn when not in operation:
	    With battery:
	< 20 mA with 12 V or 24V supply (configurable)
	    Without battery:
	< 50 mA with 12 V supply (depends on active peripherals)
	< 25 mA with 24 V supply (depends on active peripherals)

	Deep sleep mode: <2mA with 12/24Vsupply
Protection	ISO7637-2 (Over voltage rating: 56 V DC for 60 s) Reverse polarity: ISO7637-2 (-30 V for 60 s) Tested in accordance with ISO7637 for both 12V and 24V vehicles Outputs are protected by unit (limited to 0 to 36V)

GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) (internal and external antennas)

Receiver Type	NEO-M8U u-blox M8 Untethered dead reckoning module including 3D inertial sensors 72-channel u-blox M8 GNSS Engine, GPS L1C/A, SBAS L1 C/A, QZSS L1C/A, QZSS L1-SAIF, GLONASS L1oF, Beidou B1I, Galileo E1B/C
RTC	Temperature Compensated Crystal Oscillator (TCXO) for temperature stability and for faster warm and hot starts
Max navigation update rate	Single GNSS up to 30 Hz Rates with SBAS and QZSS enabled for >98% fix report rate under typical conditions is: 2 Hz
Velocity accuracy ([1] 50% @ 30 m/s)	Single GNSS up to 30 Hz Rates with SBAS and QZSS enabled for >98% fix report rate under typical conditions is: 2 Hz
Heading accuracy	0.5 m/s[1]
Horizontal Positioning Accuracy ([2]CEP, 50%, 24 hours static, -130 dBm, 6VSs)	Autonomous[2] 2.5 m SBAS[2] 1.5 m
Altitude Accuracy ([2]CEP, 50%, 24 hours static, -130 dBm, 6VSs)	SBAS[2] 3.5 m
Start-up Time / Acquisition[3] ([3]All SV @ –130 dBm)	GPS Cold starts: <26 s Aided starts: <3 s Hot starts: <1.5 s
Sensitivity [4] ([4] Demonstrated with a good external LNA)	GPS & GLONASS Tracking and navigation: -160 dBm Reacquisition: -160 dBm Cold starts: -148 dBm Hot starts: -157 dBm
Operational Limits	Dynamics: ≤ 4 g Velocity: 500 m/s Altitude: 50 000 m
Antenna	External, active antenna Centre Frequency: 1575 ± 10 MHz Bandwidth: 35 MHz Impedance: 50 Ω The unit is able to detect when the external antenna is disconnected or damaged
Spoofing detect and Message Integrity Protection	The NEO-M8U provides a function to detect third party interference with the UBX message stream sent from the receiver to host. Spoofing is when a malicious third party tries to take control the reported position via a fake GNSS broadcast signal. This may result in reporting in reporting incorrect position, velocity or time.
Dead Reckoning (build-in Gyroscope)	Supports u-Blox's proprietary Untethered Dead Reckoning (UDR), using the inertial measurement unit (IMU) included with the module. Positioning at rates of 30 Hz Dead reckoning allows navigation to commence as soon as power is applied to the module (i.e. before GNSS fix has been established) and given the following conditions: a) The vehicle has not moved without power applied to the module b) At least a dead-reckoning fix was available when the vehicle was last used c) A back-up supply has been available for the module since the vehicle was last used.

Modem

Module	Quectel EG25-G: LTE Cat 4 with 3G/2G fall-back (LTE, UMTS/HSPA+ and GSM/GPRS/EDGE coverage)
Data Transfer	UMTS Terrestrial Radio Access (UTRA) Frequency Division Duplex (FDD) 3GPP Release 7 Evolved High Speed Packet Access (HSPA+) **PRIMARY MODE - LTE:** LTE FDD: Max 150 Mbps (DL)/ 50Mbps (UL) LTE TDD: Max 130 Mbps (DL)/ 30Mbps (UL) **FALL BACK MODE – 3G/UTMS:** DC-HSDPA: Max 42 Mbps (DL) HSUPA: Max 5.76Mbps (DL) / Max: 384 Kbps (UL) WCMA: Max 384 Kbps (DL) / Max 85.6 Kbps (UL) **FALL BACK MODE –2G/GSM:** EDGE: Max 296 Kbps (DL) / Max 236.8 Kbps (UL) GPRS: Max 107 Kbps (UL) / Max 85.6 Kbps (UL)
Frequency Bands	LTE FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE TDD: B38/B39/B40/B41 UMTS: B1/B2 /B4/B5/B6/B8/ B19 GSM: B2/B3/B5/B8
Transmit Power	• Power Class 3 (23 dBm ± 2dB) for LTE-FDD bands • Power Class 3 (23 dBm ± 2dB) for LTE-TDD bands • Power Class 3 (24 dBm) for WCDMA bands • Power Class E2 (27 dBm ± 3dB) for GSM850 8-PSK • Power Class E2 (27 dBm ± 3dB) for GSM900 8-PSK • Power Class E2 (26 dBm ± 3dB) for GSM1800 8-PSK • Power Class E2 (26 dBm ± 3dB) for GSM1900 8-PSK • Power Class 1 (30 dBm ± 2dB) for DCS1800 • Power Class 1 (30 dBm ± 2dB) for PCS1900 • Power Class 4 (33 dBm ± 2dB) for GSM850 • Power Class 4 (33 dBm ± 2dB) for E-GSM900
Antenna	2 X External antennae with FAKRA connector provided (primary and diversity) The primary antenna is a puck antenna with 3 connectors for LTE, WiFi-BT and GNSS. The unit is able to detect when the external antenna is disconnected or damaged.

Bluetooth Low Energy

General	Bluetooth 4.2 (NINA-W151) Bluetooth Low energy and BR/EDR Max output power EIRP: 6 dBm Sensitivity: -88 dBm Max BT connections: 5 Max Access Point [max stations]: 10
Antenna	External antenna with FAKRA connector (shared with WiFi, LTE and GNSS). The unit is able to detect when the external antenna is disconnected or damaged.

WiFi

General	The module supports IEEE Std 802.11 b/g/n Max output power EIRP: 16 dBm Sensitivity: -96 dBm conducted Max range: 500 m Max throughput [Mbits/s]: 16
Antenna	External antenna with FAKRA connector (shared with LTE Diversity, GNSS and Bluetooth/WiFi). The unit is able to detect when the external antenna is disconnected or damaged.

Backup battery (optional)

Properties	3,2 V; 1600 mAh LiFePO4 Battery
	(>24 hours in the absence of vehicle battery power, dependent on operational conditions)
	The expected life duration of the battery is at least 2 years, if operated within the specified temperature limits, namely: -20 to 60 °C.
Operating temperature	Discharge: -20 to 60 °C
	Charge : 0 to 45 °C
	[The software will not charge or discharge the unit outside these temperature ranges.]

STATUS LEDs

Description	1 X Code Plug LED
	1 X Power LED
	2 x General Purpose LEDs

Buzzers

Function	1x Buzzer included in main harness provides audible feedback

MagiX: 434 MHz Transceiver (MiX 4412/-B, MiX 4452/-B, and MiX 4401/-B)

RF Transceiver	Receiver frequency:	434.3 MHz
	Channels:	1
	Frequency deviation:	10 kHz
	RF Bandwidth:	39.2 kHz
	RF Radiated Output Power:	10 mW max
	Modulation:	2 Level FSK
	Data rate:	19200bps

STATUTORY AND REGULATORY

California Proposition 65

CALIFORNIA PROPOSITION 65

⚠️ WARNING

This product can expose you to chemicals including Carbon black and Nickel, which are known to the State of California to cause cancer, and including Bisphenol A and 1,3-Butadiene, which are known to the State of California to cause birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.za

Compliance

FCC/PTCRB (FCC ID: 2AFMS-6AMB4G)
PTCRB
E11 (10R-06 11418)
RCM
ANATEL (15973-21-0887)

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