Micronet SmarTab 8

Rugged Android™ Tablet

Hardware Guide

Revision 6.2 March 2020

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Revision History

Revision	Date	Change
1	July 2019	Document created
2	October 2019	Critical Design Review
3	November 2019	Update QA inputs
4	Desember 2019	Update CS inputs
5	December 2019	Update pictures
6	December 2019	Update pictures
6.1	February 2020	Formatting changes
6.2	March 2020	Add section 12

Safety Precautions

Read the following safety precautions before installation or operation.

WARNING!

Abnormal Conditions

Should the Micronet SmarTab 8 become hot, start to emit smoke or a strange odor, immediately turn off the power and contact your original dealer or authorized service provider. Continued usage is dangerous and may result in fire or electric shock.

WARNING!

Foreign Objects

Avoid having foreign matter or objects enter any opening of the Micronet SmarTab 8. This could result in fire or electric shock. Immediately turn off the power and contact your original dealer or an authorized service provider.

WARNING!

Liquids

Keep the device away from water, other liquids, and liquid containers. Liquid entering the device can cause fire and electric shock.

CAUTION

LCD Screen

Never apply heavy pressure to the Micronet SmarTab 8 display or subject it to strong impact. Doing so may crack the screen or LCD panel glass resulting in personal injury or major damage to the device. Should the LCD panel glass break, do not touch the liquid inside. Should liquid from the LCD panel accidentally touch a person's skin or enter a person's mouth or eyes, immediately rinse the area affected with water and contact a physician.

CAUTION

Battery and Power Supply

- Charge the battery only as instructed on Charging the Battery.
- Immediately stop charging the battery or device if overheating, unusual smell, smoke, color change, and distortion are detected.
- Battery charging temperature can be reviewed on the Charging Temperature section
- The Micronet SmarTab 8 includes an unremovable battery. Therefore, the Micronet SmarTab 8 rear panel should not be opened to remove the battery.

CAUTION

Risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Be careful using the earphone since excessive sound pressure from the ear and headphones can cause hearing loss.

1. Introduction

Micronet SmarTab 8 Platform Overview

The Micronet SmarTab 8 is a rugged Android tablet designed for both in-vehicle and out-of-vehicle use. It provides a versatile vehicle-centric mobile computing platform for a variety of MRM (Mobile Resource Management) applications.

With integrated GPS, cellular communication, cameras, and support for a suite of vehicle and peripheral interfaces, the Micronet SmarTab 8 enables a host of advanced mobility solutions such as ELD HOS, Driver Behavior, ADAS, Video Analytics, Driver Distraction Solutions, Routing and Dispatch, Fuel Efficiency, Navigation, Fleet Tracking, Driver Interaction, and more.

The Micronet SmarTab 8 is designed to operate in rough commercial, automotive environments, including a wide range of temperatures, vibrations, and shock. Because of this, the Micronet SmarTab 8 significantly lowers the Total Cost of Ownership.

The Micronet SmarTab 8 platform supports the Android 9 operating system. Its Open Platform offers a comprehensive development environment for independent application programming and system integration.

The Micronet SmarTab 8 is a GSD™ enabled device, allowing for advanced device updates and control.

Using the integrated GPIO, GPS, and 4G LTE DC-HSPA+ cellular communication features, the Micronet SmarTab 8 platform supports a fully integrated and standalone fleet management solution.

Micronet SmarTab 8 Cradle Models

Micronet has implemented the SmarTab 8 cradle platform in two product models:

- **Standard Cradle Model** - provides Basic key features set, described in the Standard Cradle list below.
- **Enhanced Cradle Model** - provides basic + enhanced key features set, described in the Enhanced Cradle list below.

Portable and Fix Options

The two cradle models can be used as portable or fixed options. The SmarTab 8 can be docked and locked in the cradle by using a special screw and plastic cover to hide the screw. Please refer to Fix Mount Lock for more information.

Wireless Module

The Micronet SmarTab 8 tablet supports cellular communication via GSM, CDMA, WCDMA, TD-SCDMA, LTE, and WLAN/BT/FM/NFCan channels.

GSD® Software Services

Micronet's GSD™ (Guardian System Design) is a cloud-based Software as a Service (SaaS) platform for managing mobile devices in the field.

GSD™ enables remote delta-based, over-the-air, firmware, and application updates allowing customers to keep devices relevant anywhere, anytime. It features Mobile Device Management functionality, Remote Control, and self-tests.

Administrators can proactively monitor and manage connected devices with a flexible web interface.

Introducing GSD® - Advanced software tools to manage and support mobile devices in the field.

Micronet's new comprehensive software framework called GSD® - Guardian System Design - is a cloud-based Software-as-a-Service platform that provides advanced software tools to manage and support applications and system firmware upgrades on Micronet and third-party devices installed in the field. The GSD® enables remote over-the-air access and control of Android-powered mobile devices to conduct individual or group diagnostics to support training activity.

GSD® a fully integrated software framework enabling new levels of control, support, and corporate policy compliance.

GSD® is offered on the Micronet SmarTab 8 series of rugged, automotive-grade MDTs. It enables both firmware and application software to be remotely managed, simplifies maintenance, troubleshooting, and remote training, which significantly reduces operational costs over the lifetime of the product and substantially improves user experience and customer satisfaction.

GSD® features cloud-based SaaS solutions offered as two key services:

- Mobile Device Management and remote control.

- Fail-safe firmware and application over-the-air updates (FOTA/OTA).

Development Tool Kit

Micronet's SmarTab 8 Development Package provides all the tools required for product evaluation, application development, quick-start, and product testing. The Developers Package contains all essential hardware and software components as described in the following sections:

Hardware

- Micronet SmarTab 8 Tablet
- SmarTab 8 Standard or Enhanced cradle
- Wall power supply
- Main cable harness
- Mechanical and interface connection accessories
- Mounting accessories

Software

- Software Development Kit (SDK) provides a set of software tools and API documentation.
- Android demo samples for some device features, including the source code.

Documentation

- Micronet SmarTab 8 Hardware Guide
- Micronet SmarTab 8 Getting Started Guide
- Micronet SmarTab 8 OS Update Guide
- Micronet SmarTab 8 Remote Control and Display Guide

Platform Key Feature Specifications

The Micronet SmarTab 8 Tablet key feature specifications are documented in the "Micronet SmarTab 8 Datasheet" document provided with the DTK documentation.

2. Micronet SmarTab 8 Views

Micronet SmarTab 8 Front View

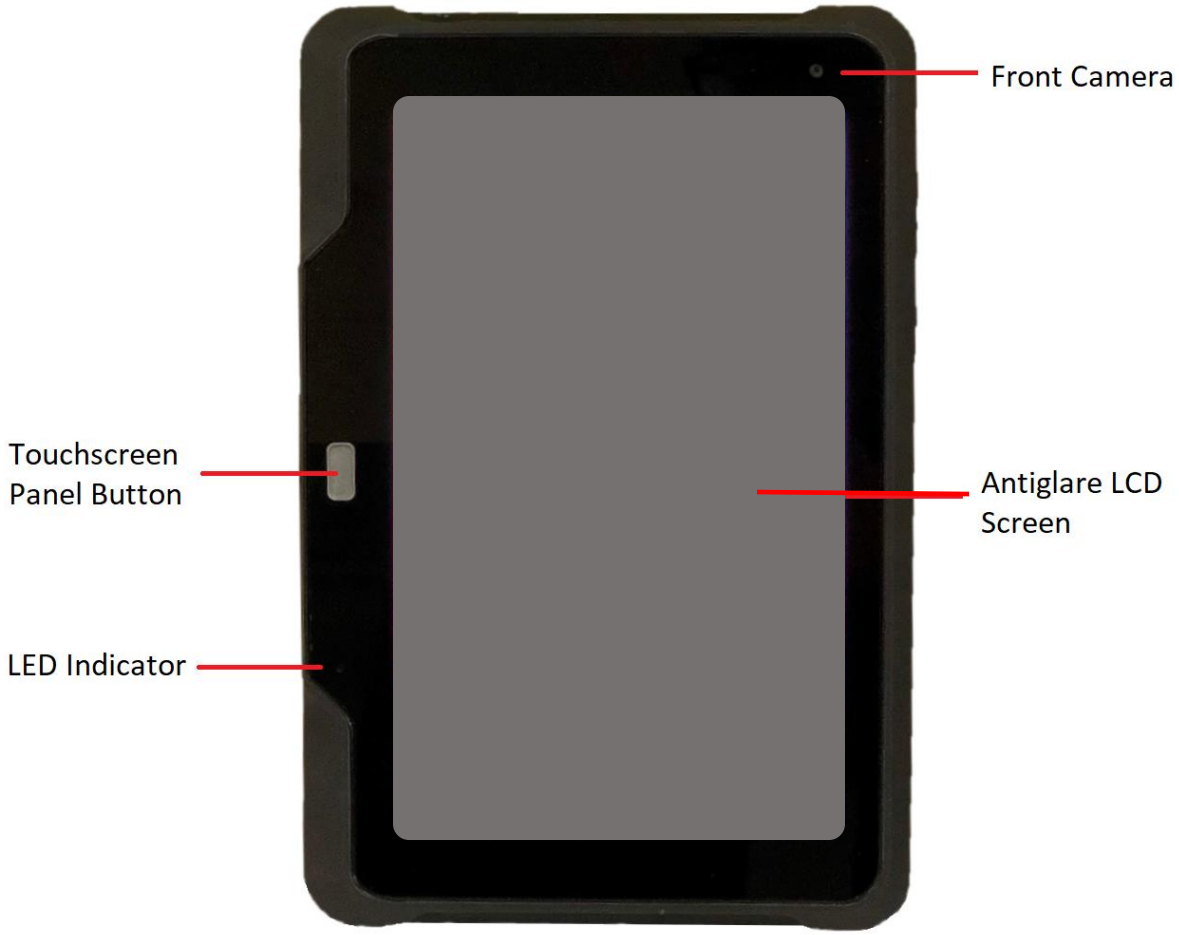

Figure 1: Micronet SmarTab 8 Front View

For more information about the Micronet SmarTab 8 front view see:

- Antiglare LCD and Touch Panel
- Touch Buttons on the Touch Screen Panel
- Front Camera
- LED Indicator

Micronet SmarTab 8 Rear View

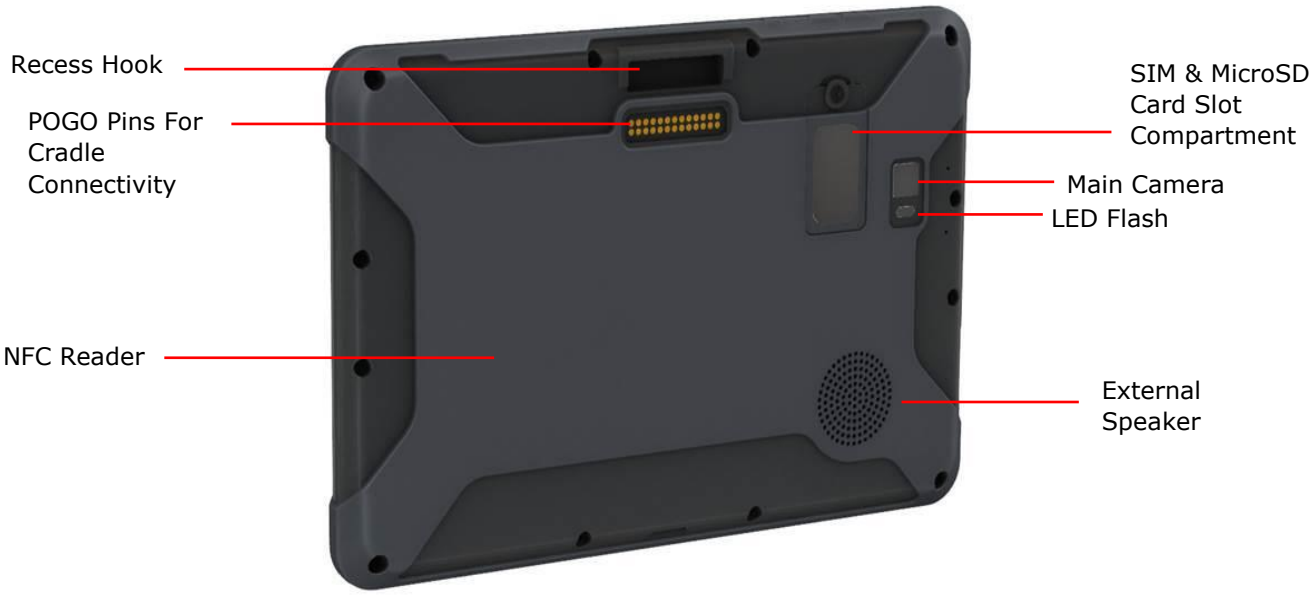

Figure 2: Micronet SmarTab 8 Rear View

For more information about the Micronet SmarTab 8 rearview see:

- Recess Hook to lock the Micronet SmarTab 8 on the cradle
- POGO Pins to establish a connection between the Micronet SmarTab 8 and cradle PCBAs. It provides battery charging, ignition switch state, cradle detection, and serial communication
- NFC Proximity
- Rear Camera
- External Speaker
- LED Flash
- MicroSIM Card Slot
- MicroSD Card Slot

Micronet SmarTab 8 Top View

Figure 3: Micronet SmarTab 8 Top View

For more information about the Micronet SmarTab 8 left view see:

- Power Key
- Audio Key

Micronet SmarTab 8 Left View

Figure 4: Micronet SmarTab 8 Left View

For more information about the Micronet SmarTab 8 right view see:

- Headphone Jack
- USB Type-C Connector

3. Micronet SmarTab 8 Functional Details

Platform Core

Operating System

The Micronet SmarTab 8 tablet runs on Android 9 Pie.

ELD Compliance

The Micronet SmarTab 8 system boot time is ~40 seconds. The ELD requirement is up to 1 minute. Please refer to ELD Mandate for more information.

Application Development Environment

The Micronet SmarTab 8 tablet supports any open source IDE. Micronet recommends using the Android Studio IDE for application development.

Micronet's Development Toolkit (DTK) includes the following components:

- Micronet SDK accessible via Micronet Knowledgebase
- Application samples that demonstrate Micronet's proprietary APIs
- Device management and upload tools
- Development accessories
- Documentation

For more details about the development infrastructure, product tools, and DTK contents, please refer to the "Micronet SmarTab 8 Tablet Getting Started" Guide.

Processor

- Qualcomm Snapdragon™ 450 – 2.0 / 2.2 GHz Octa Core
- High-performance Superscalar 8x 64-bit ARM® Cortex™ A-53

RAM

3 GB LPDDR3 RAM memory

Flash Memory

32 GB eMMC

Watchdog

To monitor mission-critical processes, the platform provides an intelligent hardware watchdog mechanism. The watchdog provides various capabilities for temperature control and restarts the tablet if the system hangs.

The Android OS provides a software level watchdog mechanism by the "Applications Manage" to control application stability and recovery.

User Interface

LCD and Touch Panel

The Micronet SmarTab 8 has an 8" HD color LCD, TFT, 1280x800 pixels, brightness of 500 NITS. The touch panel has an antiglare Gorilla Glass 4 surface and a capacitive multi-touch (5-point) panel.

Hard Keys

The Micronet SmarTab 8 has three keys on the top of the tablet:

- Power key for power on and off, restart, and suspend mode.
- Audio up and down keys to adjust the volume.

Touch Buttons

The Micronet SmarTab 8 has five touch buttons as part of the touch panel on the bottom of the front panel. The keys are Home, Back, Menu, F1, and F2 buttons. F1 and F2 are dedicated for customer use with pre-defined key codes.

NFC Proximity

The Micronet SmarTab 8 tablet provides an NXP PN547 NFC (Near Field Communication) proximity reader. It supports 13.56MHz cards and complies with IS15693 and IS18000-3 standards.

NFC Antenna

The NFC antenna located on Micronet SmarTab 8 back panel. When docked, the cradle has a slot for inserting the NFC card, as described on the pictures below:

Picture 6: Tablet NFC Proximity Reader Area

Picture 7: Cradle NFC Reader Slot

LED Indicator

The Micronet SmarTab 8 has an LED indicator on the bottom, the right side of the front panel.

Cameras

Rear Camera

The Micronet SmarTab 8 has a 13MP rear camera with autofocus on the back panel.

Front Camera

The Micronet SmarTab 8 has a 5MP front camera with autofocus on the front panel.

LED Flash

The Micronet SmarTab 8 has an LED Flash that can be used with the main rear camera.

Sound

External Speaker

The Micronet SmarTab 8 tablet has a 1-Watt integrated speaker located on the rear panel.

Microphone

The platform has a highly sensitive microphone located at the bottom of the right panel.

Headphone

The Micronet SmarTab 8 has an Open Mobile Terminal Platform (OMTP) 3.5mm Jack headphone on the left panel.

Connectivity

Wireless LAN

The Micronet SmarTab 8 tablet provides a Dual-Mode Wireless Local Area Network (IEEE 802.11 b/g/n/ac - 2.4/5GHz) module with integrated onboard internal antennas.

Wireless LAN communication is especially suited for high-speed data transfer over the air when a hotspot infrastructure exists. For applications that require large data transactions, wireless LAN is the most economical way to implement the solution.

The WLAN module provides a 2.4 or 5 GHz IEEE 802.11 b/g/n/ac Ethernet adapter with a high wireless speed up to 150Mbps. The module supports WPA/WPA2 encryption, Wi-Fi Direct, and HotSpot Tethering for up to 10 users simultaneously.

Bluetooth 4

The Micronet SmarTab 8 provides a Bluetooth v4.2 (voice & data) BLE module.

Cellular Modem

The Micronet SmarTab 8 tablet provides two hardware options of the cellular modem:

- **3.5G GSM** - B8/850/900 and B3/1800/1900, WCDMA 1/2/4/5/8 (DC-HSPA+) B1/2100 and B8/900 for Europe.

4G LTE – North America bands, AT&T and T-Mobile B2 1900MHz, B4 AWS1700MHz, B5 850MHz, B12/B13 700MHz. The modem supports all the following LTE FDD bands on the table below: 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 20, 28.

FDD LTE BANDS & FREQUENCIES					
LTE BAND #	UPLINK (MHZ)	DOWNLINK (MHZ)	BANDWIDTH (MHZ)	DUPLEX SPACING (MHZ)	BAND GAP (MHZ)
1	1920 - 1980	2110 - 2170	60	190	130
2	1850 - 1910	1930 - 1990	60	80	20
3	1710 - 1785	1805 -1880	75	95	20
4	1710 - 1755	2110 - 2155	45	400	355
5	824 - 849	869 - 894	25	45	20
6	830 - 840	875 - 885	10	35	25
7	2500 - 2570	2620 - 2690	70	120	50
8	880 - 915	925 - 960	35	45	10
9	1749.9 - 1784.9	1844.9 - 1879.9	35	95	60
10	1710 - 1770	2110 - 2170	60	400	340
11	1427.9 - 1452.9	1475.9 - 1500.9	20	48	28
12	698 - 716	728 - 746	18	30	12
13	777 - 787	746 - 756	10	-31	41
14	788 - 798	758 - 768	10	-30	40
15	1900 - 1920	2600 - 2620	20	700	680
16	2010 - 2025	2585 - 2600	15	575	560
17	704 - 716	734 - 746	12	30	18
18	815 - 830	860 - 875	15	45	30
19	830 - 845	875 - 890	15	45	30
20	832 - 862	791 - 821	30	-41	71
21	1447.9 - 1462.9	1495.5 - 1510.9	15	48	33
22	3410 - 3500	3510 - 3600	90	100	10
23	2000 - 2020	2180 - 2200	20	180	160
24	1625.5 - 1660.5	1525 - 1559	34	-101.5	135.5
25	1850 - 1915	1930 - 1995	65	80	15
26	814 - 849	859 - 894	30 / 40		10
27	807 - 824	852 - 869	17	45	28
28	703 - 748	758 - 803	45	55	10

MicroSIM Card Slot

The GSM modem requires a MicroSIM card connection. The MicroSIM card slot is located on the rear panel compartment of the tablet as seen below:

Pictures 7, 8: MicroSIM & MicroSD Card Slots

MicroSD Card Slot

The Micronet SmarTab 8 has a MicroSIM card slot located on the rear panel compartment of the tablet next to the MicroSIM card. SD cards are formatted as ext4 and fat32 as large as 128 GB are supported.

Cellular Antennas

The Micronet SmarTab 8 has two Main and Diversity internal integrated antennas.

GPS Receiver

The Micronet SmarTab 8 tablet provides a highly sensitive GNSS receiver (Qualcomm® IZat™ engine Gen 8C Lite), which supports 50 different channels, as well as NMEA0183 standard sentences, AGPS, GPS, and GLONASS satellites. It also supports three bands concurrently: GPS, BeiDou, and GLONASS or Galileo.

GPS Antennas

The Micronet SmarTab 8 has an integrated Ceramic internal antenna.

Battery

Capacity

The Micronet SmarTab 8 includes a non-removable Li-Polymer 6000mAh internal battery.

Charging the Battery

The Micronet SmarTab 8 provides fast charging through its USB Type-C connector on the side panel of the device and through the cradle, which is connected permanently to the vehicle’s battery. The cradle charges the tablet through the POGO pins at 5V DC power.

Charging Mechanism

The Micronet SmarTab 8 provides a smart charging mechanism. When connected to a power source (e.g., wall mount power supply, PC USB, SmarTab 8 cradle), the battery is charged and powers the CPU in parallel. On reaching temperatures above 45°C, the internal battery turns off charging from the power source (current is limited to only draw 10uA). After interrupting charging, the power source from the SmarTab 8 battery reconnects and provides power to the CPU. This mechanism prolongs the life of the battery.

Charging Temperature

The Micronet SmarTab 8 battery charging temperature is as follows:

- Charge: 0°C to ~ +45°C, 45~85% RH
- Battery operating temperature: 0°C to ~ +45°C, 45~85% RH

The operating system blocks charging when the battery temperature is over the defined (45°C). By this function, the device is protected while in operation.

Motion Control

The Micronet SmarTab 8 tablet provides an accelerometer, compass, and gyroscope module. The accelerometer is an electromechanical device used to measure acceleration forces. Such forces may be static like the continuous force of gravity or as is the case with many mobile devices dynamic to sense movement or vibrations.

Communication Interfaces

Serial Communication

The Micronet SmarTab 8 tablet provides serial communication ports through the cradle.

The standard cradle model includes one serial port, and the enhanced cradle model includes five serial communication ports. Please refer to the detailed description of the standard cradle Serial Communication and of the enhanced cradle Serial Communication.

USB Communication

The Micronet SmarTab 8 supports a USB Type-C interface, which is located on the Micronet SmarTab 8 Cradle micro-USB connector.

The SmarTab 8 standard cradle supports a USB Client interface for ADB communication. The enhanced cradle is a USB host via the USB 3.0 female cable connector, and it also supports ADB via wireless communication. Please refer to the detailed description of the standard cradle USB Communication and of the enhanced cradle USB Communication.

NOTE:
The product will connect to a USB interface of version USB 3.0 or 2.0 (no superspeed).
The ADB connection is established when the SmarTab 8 is undocked.

General Purpose I/O

Input lines

The Micronet SmarTab 8 supports general-purpose input lines for ignition sense, automotive digital lines, A2D, and other functions.

The standard cradle model includes one input line for ignition sense. The enhanced cradle model includes one input line for ignition sense and seven general-purpose input lines. Please refer to the detailed description of the standard cradle Automotive Input and for the enhanced cradle Analog and Digital Input lines.

Output Lines

The Micronet SmarTab 8 supports general-purpose Open-Collector output lines for various functions, through the enhanced cradle only. Please refer to the detailed description of the enhanced cradle Open Collector Output lines.

Vehicle Bus Connectivity

SAE - CANBus

The Micronet SmarTab 8 provides two CANBus ports through its enhanced cradle, which allow connection of a variety of vehicle peripherals, such as the vehicle's computer, sensors, and so forth. Please refer to the detailed description of the enhanced cradle SAE J1939 CANBus.

Single Wire CANBus

The Micronet SmarTab 8 provides a single wire CANBus port through its enhanced cradle. Please refer to the detailed description of the enhanced cradle Single Wire CAN.

SAE J1708

The Micronet SmarTab 8 provides a J1708 port through its enhanced cradle. Please refer to the detailed description of the enhanced cradle SAE J1708.

4. Micronet SmarTab 8 Cradle

Overview

The Micronet SmarTab 8 Platform offers two types of vehicle cradles with secure, protected device mounting and electronic connection in the vehicle. Compatible with a standard "RAM" mounting arm, the cradle is easy to install and position for the driver to use in an agitated vehicle cabin environment.

The two models of the Micronet SmarTab 8 Cradle available are the Standard Cradle Model and Enhanced Cradle Model – each various supporting features and connection interfaces.

A Micronet SmarTab 8 Device "Lock" option is available on both the Standard and Enhanced Cradle models to allow a "Fixed-Mounted" solution operation only, which prevents the removal of the device. For more details, refer to Fix Mount Lock on page 23.

ELD Mandate

The ELD (Electronic Logging Device) Mandate in the USA requires that electronic devices are always connected to the vehicle to obtain telematics information for HOS. Since the Micronet SmarTab, 8 is a portable device, and all telematics information is stored on the device, the cradle is equipped with an LED and Buzzer to alert when the device is not docked while the vehicle's ignition switch is ON. This LED and Buzzer warns and reminds the driver to dock the device in the cradle.

Cradle Front View

Figure 8: Cradle Front View Components

For more information about the cradle front view see:

- Latch for dock and undock the Micronet SmarTab 8
- LED and Buzzer
- Customized Front Panel Label

Cradle Rear View

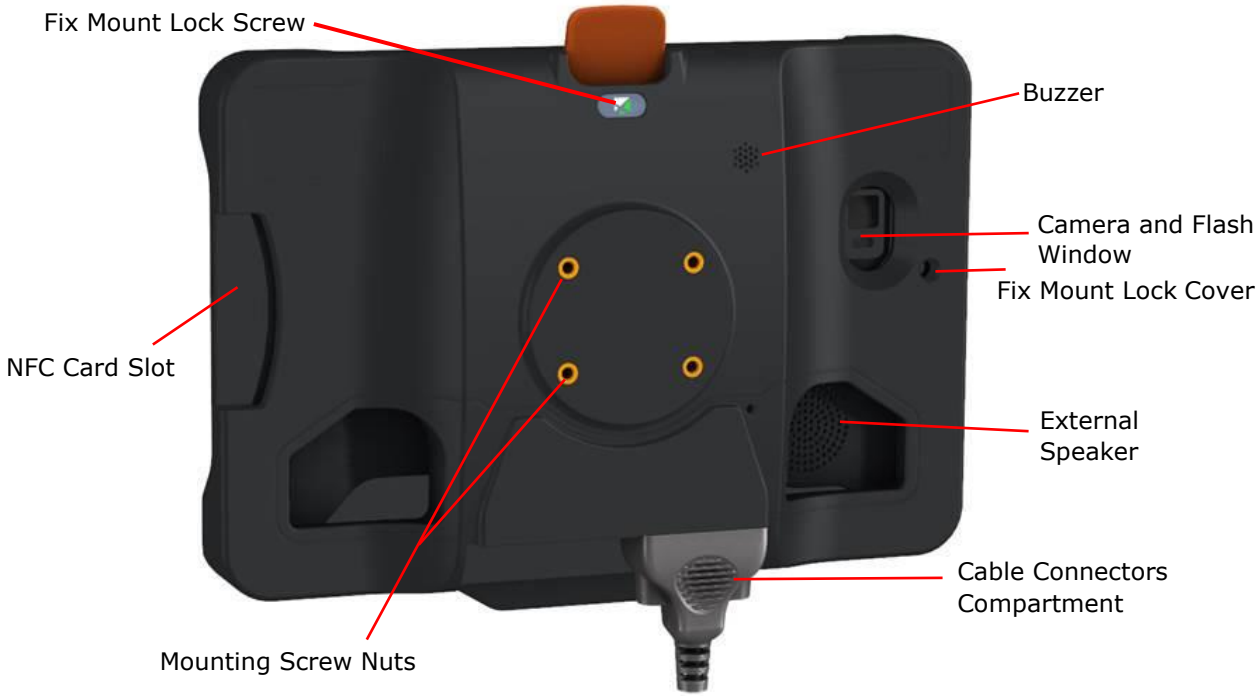

Figure 9: Cradle Rear View Components

For more information about the cradle rearview see:

- NFC Proximity Slot
- Mounting Arm Screw Nuts
- Fix Mount Lock
- LED and Buzzer

Fix Mount Lock

The Standard and Enhanced cradles have a locking mechanism option to dock the SmarTab 8 to the cradle permanently. It is an option when a fix mount installation is required. The fix mount lock parts include one screw to prevent pushing the latch and an adhesive cover to hide the screw.

LED and Buzzer

The LED and buzzer are used to alert the driver that the Micronet SmarTab 8 is not docked. This alert is enabled by default. The cradle's MCU firmware provides an API to disable both the LED and buzzer if required.

5. Standard Cradle Model

Overview

The standard cradle model supports a basic set of interfaces, including vehicle power, an ignition switch signal, and an RS232 communication port.

Functional Details

The Micronet SmarTab 8 standard cradle provides the following interfaces:

- 12V/24V line to charge the Micronet SmarTab 8 battery
- A2D input signal for ignition switch control
- USB TYPE-C for ADB connection
- An automotive general-purpose (digital or A2D) input and an open-collector output
- Serial & Debug communication ports

Standard Cradle Dev Cable

The Micronet SmarTab 8 standard cradle development cable, shown in figure 10 below, exposes power, ignition, USB Type-C, a serial communication line, and a serial debug line and two GPIOs.

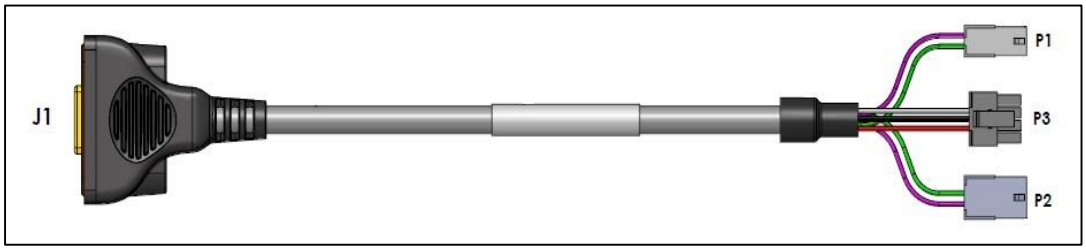

Figure 10: Standard Cradle Cable Harness GCAB596.

The pinout for P1, P2, and P3 is displayed in the standard cradle pinout in Figure 11 below:

SIGNAL	J1	P1	P2	P3	AWG	COLOR	TWISTED PAIR	SHIELD
IGNITION	3	1			24	RED/WHITE	T1	
POWER_INPUT	1	4			24	RED	T1	
PWR_GND	2	3			24	RED/BLACK	T6	
GP_IN1	14		1		24	YELLOW	T4	
GP_OUT1	9		2		24	PURPLE	T4	
UART_TX	8		5		24	TAN	T5	
UART_RX	12		4		24	BLACK	T7	
GND	13		6	8	24	RED/BLUE	T7	
				3				
OTG_USB_VBUS	6			5	24	ORANGE/BLACK	T5	
OTG_USB_DN	4			6	24	WHITE	T2	
OTG_USB_DP	5			7	24	GREEN	T2	
USB_GND	7			4	24	WHITE/BLACK	T6	
DBG_TX	10			1	24	BLUE	T3	
DBG_RX	11			2	24	ORANGE/GREEN	T3	

Figure 11: Micronet SmarTab 8 Basic Cradle Cable Pinout

Power Connector

The power connector (marked as **P1**) is a 4-pin, 2-row MicroFit 3.0 series Molex male connector and the pinout for power and ignition lines are described in figure 12 below:

Figure 12: Molex 4-Pin Male Connector

Cradle Power Consumption

Table 1: Micronet SmarTab 8 Standard Cradle Current Consumption

Micronet SmarTab 8/ Standard Cradle Current Consumption			
Micronet SmarTab 8 Un-docked		***Micronet SmarTab 8 Docked***	
12V	***24V***	***12V***	***24V***
3mA	3mA	240mA	130mA

USB Communication

The standard cradle has a USB 'Type C' device connector (marked as **P3** in Figure 10 above) that supports DFP (Downstream Facing Port) for device connection and UFP (Upstream Facing Port) for connecting to a USB HUB, Desktop, ADB for debugging, device configuration, and application development. It also supports dual-role behavior according to the USB3. X standard for DRP (Dual Role Port). Connect the USB connector to a computer USB host port. Please refer to the "Remote Control and Display Guide" on how to install the USB driver for ADB communication. Below is the 8-pin Molex connector for USB-C on the standard cradle dev cable:

Figure 13: Molex 8-pin Female & USB Device 'Type A' Male Connector

There are two ways to use the USB:

- Through the Micronet SmarTab 8 USB Type-C connector on the left panel.
- Through the standard cradle USB cable while the tablet is docked.

Note:

OS Burn using Fastboot only works through the USB Type-C plug – not the cradle.

Serial Communication

The Micronet SmarTab 8 standard cradle provides a serial communication (on **P2**) and serial debug interface (on **P3**). The serial communication connector (marked as **P2**) is described similarly in figure 10 above and is shown in figure 14 below:

Figure 14: Molex 6-Pin Male Connector

Serial Port 1 (COM1)

The Micronet SmarTab 8 standard cradle supports an (EIA) RS-232 level serial communication on its port. It provides TX and RX signals at 300 to 115,200bps.

Debug Serial Port (COM7)

The standard cradle also supports EIA-RS232 level serial communication port for Co-Processor debugging purposes. The port supports a baud rate of 300 to 115,200bps and provides the TX and RX signals only.

Automotive Input / Output

The Micronet SmarTab 8 standard cradle provides a single automotive digital input in addition to the ignition A2D pin and a single automotive output.

Ignition input line powers ON the Micronet SmarTab 8 from shutdown and suspend states. For proper power management implementation, the ignition input line should connect to the vehicle's ignition switch, and power to the cradle should connect to the vehicle's battery. See Electrical Installation for more information.

Shown in table 2 are the electrical specifications for the automotive input and output pins:

Table 2: Automotive Signal States, Electrical Parameters

Input State	Typical (V)	Min Voltage (V)	Max Voltage (V)
LOW	0V	-30V	+6V
HIGH	12V-24V	+7V	+30V

Output State	Max Saturation Voltage (V)	Max Voltage (V)	Max Current (A)
HIGH	0.6V	+VIN	300mA

6. Enhanced Cradle Model

Overview

The Enhanced Cradle **ST-CRD** model supports a wide range of serial communication ports, control I/O signals, and vehicle BUS interface connections.

Platform Core

MCU Processor

The enhanced cradle MCU CPU consists of the Freescale K20_120 MQX RTOS.

Functional Details

The Micronet SmarTab 8 enhanced cradle provides the following interfaces:

- 12V/24V for charging the Micronet SmarTab 8 battery
- Digital input signal for ignition switch control
- Seven general-purpose input lines, A2D or Automotive digital inputs
- Four general-purpose open-collector output lines
- Three serial communication lines and co-processor debug line
- J1939 CAN interfaces
- Single Wire CAN
- J1708 interface

Enhanced Cradle Dev Cable

In addition to the standard cradle, the Micronet SmarTab 8 enhanced cradle also provides two J1939 CAN interfaces, a Single Wire CAN line, a J1708 line, two more serial communication lines, and five more GPIOs. The power and ignition lines, a serial comm and serial debug line, and two of the GPIOs are included in the enhanced cradle DTK package; however, these interfaces are part of the standard cradle – see Standard

Cradle Dev Cable. The additional enhanced cradle interfaces are shown below in figure 15 and 16 on the enhanced cradle development cable drawing and pinout:

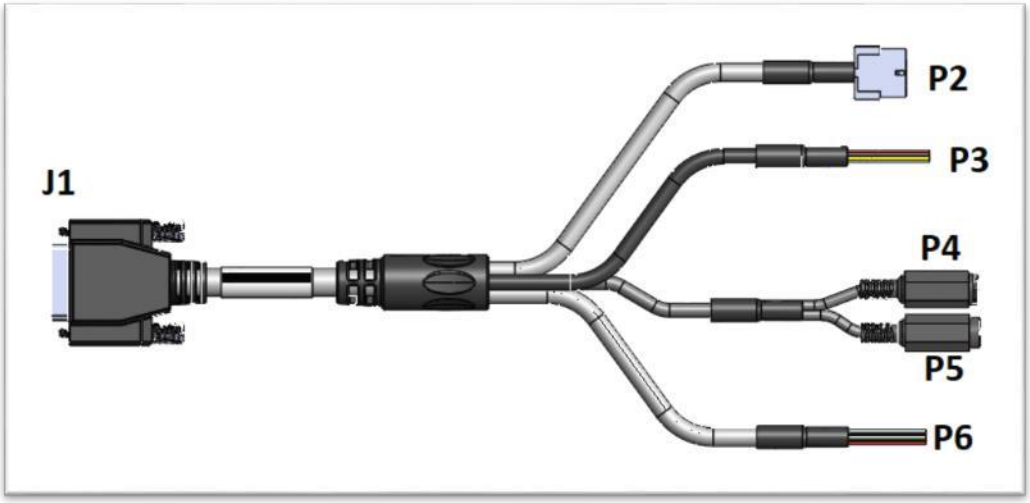

Figure 15: Enhanced Cradle Cable Drawing (GCAB579).

The pinouts for P2 – P6 are displayed in the enhanced cradle pinout in Figure 16 below:

COLOR	J1	AWG	TWISTED PAIR	P2	P3	P4	P5	P6	FUNCTION
RED	5	26	T1	1					CAN1_P
WHITE	15	26	T1	2					CAN1_N
GREEN	22	26	T2	3					CAN2_P
YELLOW	23	26	T2	4					CAN2_N
BLUE	24	26	T3	5					J1708_P
PURPLE	25	26	T3	6					J1708_N
BLACK	18	26		7					GND
RED/WHITE	26	26		9					SWC
ORANGE	17	26			1				CTS
BLUE	20	26			2				RTS
BROWN	21	26			3				UART_TX2
YELLOW	8	26			4				UART_RX2
PURPLE	9	26			5			10	GND
BLACK	10	26	T4				1		MIC_P
BLACK/WHITE	19	26	T4				2		MIC_N
SHIELD	9	26				03	3		GND
BROWN	1	26	T5			1			SPEAKER_P
BROWN\WHITE	11	26	T5			2			SPEAKER_N
SHIELD	9	26				3	03		GND
BLUE	4	26						1	GP_IN2
PURPLE	14	26						2	GP_IN3
LIGHT BLUE	3	26						3	GP_IN4
GRAY	13	26						4	GP_IN5
PINK	2	26						5	GP_IN6
BROWN	12	26						6	GP_IN7
WHITE	6	26						7	GP_OUT2
GREEN	16	26						8	GP_OUT3
LIGHT GREEN	7	26						9	GP_OUT4

Figure 16: Micronet SmarTab 8 Enhanced Cradle Cable Pinout

Vehicle Bus Connectivity

CANbus Connector

The CANbus connector (marked as **P2**) is a 10-pin, 2-row MicroFit 3.0 series Molex male connector, shown in figure 17 below, which provides CAN 1 HIGH/LOW, CAN 2 HIGH/LOW, J1708, and Single Wire CAN:

Figure 17: Molex 10-Pin Male Connector

SAE CANBus

The SmarTab 8 enhanced cradle provides two SAE CANBus ports that enable the connection of a variety of vehicle peripherals, such as the vehicle's computer, vehicle's sensors and so on.

The provided CANBus V2.0B supports the following functionality:

- Software configurable BAUD rate Supported bitrates:
  10 Kbits/sec, 20 Kbits/sec, 33.33 Kbits/sec (only supported by CAN2 and not by CAN1), 50 Kbits/sec, 100 Kbits/sec, 125 Kbits/sec, 250 Kbits/sec, 500 Kbits/sec, 800 Kbits/sec, 1 Meg bits/sec.
- Software configurable Transmission mode (Silent, Normal)
- Extended, Standard, and Remote frame formats are supported.
  - 29-bit and 11-bit identifiers ○ 0
  – 8-byte length in the data field
- 24 Extended/Standard configurable filter ids
- 16 Extended/Standard configurable mask ids

Single Wire CAN

The SmarTab 8 enhanced cradle provides SAE J2411 single wire for CAN network applications with low requirements regarding bit rate and bus length. The communication takes place via just one bus line with a nominal data rate of 33.3 Kbit/s (83,3 Kbit/s in a high-speed mode for diagnostics).

SAE J1708

The SmarTab 8 enhanced cradle provides one SAE J1708 port. The SAE J1708 is a standard used for serial communications between ECUs on a heavy-duty vehicle and between a computer and the vehicle. With respect to the Open System Interconnection model (OSI), J1708 defines the physical layer.

Serial Communication

The enhanced cradle supports four serial communication ports for external devices connections, and a debug port connected to the MCU Co-Processor. These ports support various hardware and software flow control functions. For more information about the interface signals, please see the signal map Pinout by Functionality.

Serial Connector

The Micronet SmarTab 8 enhanced cradle provides an additional two serial communication lines (on **P3**) compared to the standard cradle. The serial communication connector is described similarly in figure 16 above and is shown in figure 18 below:

Figure 18: Molex 6-Pin Male Connector

Serial Port 1 (COM1)

The Micronet SmarTab 8 enhanced cradle adds an (EIA) RS-232 level serial communication on its port. It provides CTS and RTS signals at 300 to 115,200bps.

Serial Port 1 & 2 (COM1 & COM2)

The Micronet SmarTab 8 enhanced cradle adds an (EIA) RS-232 level serial communication on its port. It provides TX1/TX2 and TX1/RX2 signals at 300 to 115,200bps. Note, however, that the TX1/RX1 lines are on the Standard Cradle Dev Cable.

Debug Serial Port (COM7)

The standard cradle also supports EIA-RS232 level serial communication port for Co-Processor debugging purposes. The port supports a baud rate of 300 to 115,200bps and provides the TX and RX signals only. Note, however, that the TX_DBG/RX_DBG lines are on the Standard Cradle Dev Cable.

Cradle Power Consumption

Table 3: Micronet SmarTab 8 Enhanced Cradle Current Consumption

Micronet SmarTab 8/ Enhanced Cradle Current Consumption			
Micronet SmarTab 8 Un-docked		***Micronet SmarTab 8 Docked***	
12V	***24V***	***12V***	***24V***
~15mA	~10mA	~650mA	~350mA

USB Communication

USB HOST

The enhanced cradle is a USB HOST. Note, however, that the USB lines are part of the Standard Cradle Dev Cable. The USB Host interface supports the following profiles:

- USB Standard HID
- USB Printer (PCL)
- USB Storage USB CLIENT

The USB Client interface supports Android ADB for application development and device management.

The USB Client port provides Android's ADB connectivity and supports:

- Device configuration
- Management tools
- Application development
- Debugging caution

There are two ways to use the USB Client:

- Through the Micronet SmarTab 8 USB TYPE-C connector on the left panel.
- Through the Micronet SmarTab 8 cradle USB Client cable while the tablet is docked.

Note:

OS Burn using Fastboot only works through the USB TYPE-C plug – not the cradle.

General Purpose I/O

Analog and Digital Input lines

The SmarTab 8 tablet provides seven automotive input lines (0-32V) through its enhanced cradle. The input lines can be read as digital (state 0 or 1) or analog (voltage level) lines. Note, however, that the automotive input 1/output 1 line is a part of the Standard Cradle Dev Cable. Digital inputs

IGN (automotive voltage state) is for monitoring the ignition switch signal. The other seven input lines can be used for any purpose, like sensing door opening, sensing bus amber lights, etc.

The IGN line powers on the device from a shutdown state. For proper power management, the ignition line should be connected to the vehicle's ignition switch.

Analog Inputs

GPIO can be treated as an analog input to monitor the value range of compatible vehicle sensors, such as an analog fuel gauge. The supported voltage range is from 0V to 30V.

Open Collector Output lines

The SmarTab 8 tablet provides four O.C output lines through its enhanced cradle for external peripheral control.

For more information about these interface signals, please see the digital output signals map Pinout by Functionality.

Shown in table 3 are the electrical specifications for the automotive input and output pins:

Table 2: Automotive Signal States, Electrical Parameters

Input State	Typical (V)	Min Voltage (V)	Max Voltage (V)
LOW	0V	-30V	+6V
HIGH	12V-24V	+7V	+30V
Output State	**Max Saturation Voltage (V)**	**Max Voltage (V)**	**Max Current (A)**
HIGH	0.6V	+VIN	300mA

Customized Front Panel Label

Micronet provides the option to attach a customized front panel label based on your specifications. To enable rebranding the product, Micronet will provide graphic files and size specifications. This is subject to an additional charge per unit, based on the quantity ordered.

Figure 10: Customized Front Panel Label

The standard cradle model supports a basic set of interfaces, including vehicle power, an ignition switch signal, and an RS232 communication port.

Micronet SmarTab 8 Standard Cradle Current Consumption			
Micronet SmarTab 8 Un-docked		***Micronet SmarTab 8 Docked***	
12V	***24V***	***12V***	***24V***
3mA	3mA	240mA	130mA

Serial Communication

Serial Port 1 (COM1)

The Micronet SmarTab 8 standard cradle supports an (EIA) RS-232 level serial communication on its port. It provides TX and RX signals at 300 to 115,200bps.

USB Communication

USB TYPE-C

The standard cradle supports a USB Type-C port. It supports DFP (Downstream Facing Port) for device connection as UFP (Upstream Facing Port) for connecting to a USB HUB, Desktop, ADB for debugging, and device configuration. It also supports dual-role behavior according to the USB3. X standard for DRP (Dual Role Port).

There are two ways to use the USB:

- Through the Micronet SmarTab 8 USB Type-C connector on the left panel.
- Through the standard cradle USB cable while the tablet is docked.

Note:
OS Burn using Fastboot only works through the USB Type-C plug – not the cradle.

Automotive Input

The Micronet SmarTab 8 standard cradle provides one automotive digital input for ignition.

Ignition input line powers ON the Micronet SmarTab 8 from the shutdown and suspend states. For proper power management implementation, the ignition input line should connect to the vehicle's ignition switch, and power to the cradle should connect to the vehicle's battery. See Electrical Installation for more information.

Table 2: Ignition line States, Electrical Parameters

Input State	Typical	Minimum	Maximum
Low	0V	-30V	+6V
High	12V-24V	+7V	+30V

6. Enhanced Cradle Model

Overview

The Enhanced Cradle **ST-CRD** model supports a wide range of serial communication ports, control I/O signals, and vehicle BUS interface connections.

Platform Core

MCU Processor

The enhanced cradle MCU CPU consists of the Freescale K20_120 MQX RTOS.

Functional Details

The Micronet SmarTab 8 enhanced cradle provides the following interfaces:

- 12V/24V for charging the Micronet SmarTab 8 battery
- Digital input signal for ignition switch control
- Seven general-purpose input lines, A2D or Automotive digital inputs
- Four general-purpose open-collector output lines
- J1939 CAN interfaces
- Single Wire CAN
- J1708 interface

Cradle Power Consumption

Table 3: Micronet SmarTab 8 Enhanced Cradle Current Consumption

Micronet SmarTab 8/ Enhanced Cradle Current Consumption			
Micronet SmarTab 8 Un-docked		***Micronet SmarTab 8 Docked***	
12V	***24V***	***12V***	***24V***
~15mA	~10mA	~650mA	~350mA

Serial Communication

The enhanced cradle supports four serial communication ports for external devices connections, and a debug port connected to the MCU Co-Processor. These ports support various hardware and software flow control functions. For more information about the interface signals, please see the signal map Pinout by Functionality.

Serial Port 1 (COM1)

The enhanced cradle supports an (EIA) RS-232 level serial communication on its port. It provides TX and RX signals at 300 up to 115,200 bps. The serial port provides one pair of communication control handshake CTS/RTS signals.

Serial Ports 2-4 (COM2-4)

The enhanced cradle supports EIA-RS232 level serial communication ports 2-4. The ports support a baud rate of 300 to 115,200 bps and provide the TX and RX signals only.

Debug Serial Port (COM7)

The enhanced cradle supports the EIA-RS232 level serial communication port for Co-Processor debugging purposes. The port supports a baud rate of 300 to 115,200bps and provides the TX and RX signals only.

USB Communication

USB HOST

The enhanced cradle is a USB HOST. The USB Host interface supports the following profiles:

- USB Standard HID
- USB Printer (PCL)
- USB Storage USB CLIENT

The USB Client interface supports Android ADB for application development and device management.

The USB Client port provides Android's ADB connectivity and supports:

- Device configuration
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IGN (automotive voltage state) is for monitoring the ignition switch signal. The other seven input lines can be used for any purpose, like sensing door opening, sensing bus amber lights, etc.

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Open Collector Output lines

The SmarTab 8 tablet provides four O.C output lines through its enhanced cradle for external peripheral control.

For more information about these interface signals, please see the digital output signals map Pinout by Functionality.

Vehicle Bus Connectivity

SAE CANBus

The SmarTab 8 enhanced cradle provides two SAE CANBus ports that enable the connection of a variety of vehicle peripherals, such as the vehicle's computer, vehicle's sensors, and so on.

The provided CANBus V2.0B supports the following functionality:

- Software configurable BAUD rate
  Supported bitrates:
  10 Kbits/sec, 20 Kbits/sec, 33.33 Kbits/sec (only supported by CAN2 and not by CAN1), 50 Kbits/sec, 100 Kbits/sec, 125 Kbits/sec, 250 Kbits/sec, 500 Kbits/sec, 800 Kbits/sec, 1 Meg bits/sec.
- Software configurable Transmission mode (Silent, Normal)
- Extended, Standard, and Remote frame formats are supported.
  - 29-bit and 11-bit identifiers
  - 0 – 8-byte length in the data field
- 24 Extended/Standard configurable filter ids
- 16 Extended/Standard configurable mask ids

Single Wire CAN

The SmarTab 8 enhanced cradle provides SAE J2411 single wire for CAN network applications with low requirements regarding bit rate and bus length. The communication takes place via just one bus line with a nominal data rate of 33.3 Kbit/s (83,3 Kbit/s in a high-speed mode for diagnostics).

SAE J1708

The SmarTab 8 enhanced cradle provides one SAE J1708 port. The SAE J1708 is a standard used for serial communications between ECUs on a heavy-duty vehicle and between a computer and the vehicle. With respect to the Open System Interconnection model (OSI), J1708 defines the physical layer.

Customized Front Panel Label

Micronet provides the option to attach a customized front panel label based on your specifications. To enable rebranding the product, Micronet will provide graphic files and size specifications. This is subject to an additional charge per unit, based on the quantity ordered.

7. Cradle Signal Map

Overview

This chapter describes the Micronet SmarTab 8 standard and enhanced cradles signal interfaces.

Standard Cradle Signal Map

The Micronet SmarTab 8 standard cradle has the following interfaces on its main cable harness:

- Power line
- Ground line
- digital input line
- USB TYPE-C type A connector cable to be connected on the computer USB Host connector
- Serial port with TX, RX, GND signals, baud rate 300-115,200 bps

Enhanced Cradle Signal Map

Overview

The SmarTab 8 enhanced cradle has the following interfaces found on the primary and secondary cradle connectors.

The following abbreviations are used:

- I - Input signal
- O - Output signal
- B - Bus signal
- V - Voltage signal
- G – Ground
- P – Positive
- N – Negative

Interface Connectors

The SmarTab 8 enhanced cradle interface contains two Dsub Male connectors. All pins are ESD protected (against electrostatic discharge). The Main Connector Pinout and Secondary Connector Pinout tables below describe the pinout of each connector.

Main Connector Pinout

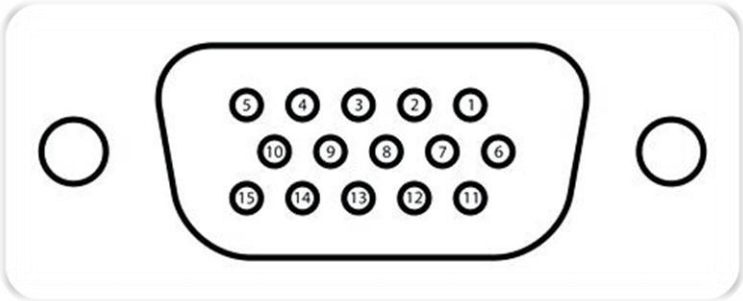

Figure 11: Main 15-pin Male D'sub connector

Pinout by Pin Number

The following table lists the main 15-pin D'sub connector signals by PIN.

Table 4: Main Connector Signal Map (by Pin Number)

Pin	Signal	Type	Function	Specifications
1	+VIN	V	Input Power 12V/24V	Typical – 12V/24V - Minimum continues – 6V (5V for up to 40ms according to ISO7637) - Maximum continues – 32V
2	VIN_GND	G	Ground	

Pin	Signal	Type	Function	Specifications			
3	Ignition Input	A	A2D Input Ignition switch		**Typical**	**Min**	**Max**
				Input Low: VIL	0V	-30V	6V
				Input High: VIH	12V-24V	+8V	+32V
4	USB D-	B	USB Port Data-	USB 3.0			
5	USB D+	B	USB Port Data+	USB 3.0			
6	USB +5V	P	USB Port VBUS				
7	GND	G	Ground				

8	RS232_TX1	O	Transmit Data (COM1)	EIA-RS232 level
9	O.C. Output	O	Open Collector Output 1	Max. switchable current = 300mA Max. switchable voltage = +VIN Max. saturation voltage = 0.6V
10	RS232_TX5	O	Transmit Data DBG	MCU Debug port EIA-RS232 level
11	RS232_RX5	I	Receive Data DBG	MCU Debug Port EIA-RS232 level
12	RS232_RX1	I	Receive Data (COM1)	EIA-RS232 level
13	GND	G	Ground	
14	Automotive Input	I	Digital Input 1	**Typical** **Min** **Max** Input Low: VIL 0V -30V 6V Input High: VIH 12V-24V +8V +30V 0V-30V max, 12k OHM
15	N/A			

Pinout by Functionality

The following table lists the 15-pin D'sub connector signals by functionality.

Table 5: Main Connector Signal Map (by functionality)

Pin	Signal	Type	Function	Specifications
1	+VIN	V	Input Power 12V/24V	Typical – 12V/24V - Minimum continues – 6V (5V for up to 40ms according to ISO7637) - Maximum continues – 32V
2	GND	G	Ground	
3	Ignition Input	A	A2D Input Ignition switch	**Typical** **Min** **Max** Input Low: VIL 0V -30V 6V Input High: VIH 12V-24V +8V +32V
4	USB D-	B	USB Port Data-	USB 3.0
5	USB D+	B	USB Port Data+	USB 3.0
6	USB +5V	P	USB Port VBUS	
7	GND	G	Ground	

Pin	Signal	Type	Function	Specifications
8	RS232_TX1	O	Transmit Data (COM1)	EIA-RS232 Level
9	O.C. Output	O	Open Collector Output 1	Max. switchable current = 300mA Max. switchable voltage = +VIN Max. saturation voltage = 0.6V
10	RS232_TX5	O	Transmit Data DBG	MCU Debug port EIA-RS232 Level

11	RS232_RX5	I	Receive Data DBG	MCU Debug Port EIA-RS232 Level
12	RS232_RX1	I	Receive Data (COM1)	EIA-RS232 Level
13	GND	G	Ground	
14	Automotive Input	I	Digital Input 1	**Typical** **Min** **Max** Input Low: VIL 0V -30V 6V Input High: VIH 12V-24V +8V +30V 0V-30V max, 12k OHM
15	N/A			

Secondary Connector Pinout

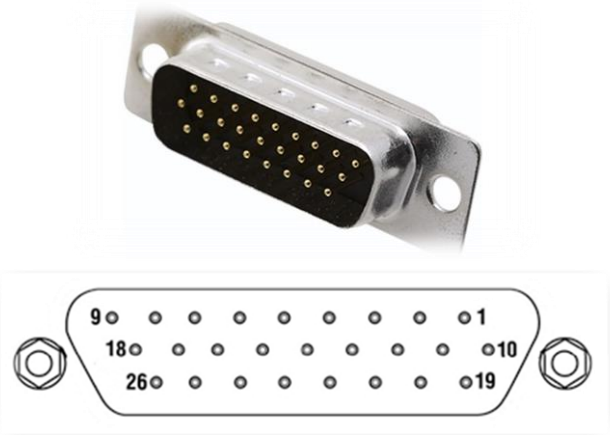

Figure 13: Secondary 26-pin Male D'sub connector

Pinout by Pin Number

The following table lists the 26-pin D'sub connector signals by PIN.

Table 6: Secondary Connector Signal Map (by Pin Number)

Pin	Signal	Type	Function	Specifications
1	Speaker +	P	Speaker Positive Signal	

Pin	Signal	Type	Function	Specifications
2	Automotive Input	I	Digital Input 6	Same as Input 1
3	Automotive Input	I	Digital Input 4	Same as Input 1
4	Automotive Input	I	Digital Input 2	Same as Input 1

5	CAN 1 H	I/O	CAN High Signal	Twisted Pair
6	O.C Output	O	Open-Collector Output 2	Same as Output 1
7	O.C. Output	O	Open-Collector Output 4	Same as Input 1
8	RS232_RX2	I	Receive Data (COM2)	EIA-RS232 Level
9	GND	G	Ground	
10	Microphone +	P	Microphone Positive Signal	
11	Speaker -	N	Speaker Negative Signal	Same as Input 1
12	Automotive Input	I	Digital Input 7	Same as Input 1
13	Automotive Input	I	Digital Input 5	Same as Input 1
14	Automotive Input	I	Digital Input 3	Same as Input 1
15	CAN 1 L	I/O	CAN 1 Low Signal	Twisted Pair
16	O.C. Output	O	Open-Collector Output 3	Same as Output 1
17	RS232_CTS1	O	CTS (COM1)	EAI-RS232 Level
18	GND	G	Ground	
19	Microphone -	N	Microphone Negative Signal	
20	RS232_RTS1	I	RTS1 (COM1)	EAI-RS232 Level
21	RS232_TX2	G	Ground	EAI-RS232 Level
22	CAN 2 H	I/O	CAN 2 High Signal	Twisted Pair
23	CAN 2 L	I/O	CAN2 Low Signal	Twisted Pair
24	J1708 +	P	J1708 Positive Signal	Twisted Pair
25	J1708 -	N	J1708 Negative Signal	Twisted Pair
26	SWC	I/O	Single Wire CAN	

Pinout by Functionality

The following table lists the 26-pin Dsub connector signals by functionality.

Table 7: Secondary Connector Signal Map (by Functionality)

Pin	Signal	Type	Function	Specifications
1	Speaker +	P	Speaker Positive Signal	
2	Automotive Input	I	Digital Input 6	Same as Input 1
3	Automotive Input	I	Digital Input 4	Same as Input 1
Pin	Signal	Type	Function	Specifications
4	Automotive Input	I	Digital Input 2	Same as Input 1

5	CAN 1 H	I/O	CAN High Signal	
6	O.C Output	O	Open-Collector Output 2	Same as Output 1
7	O.C. Output	O	Open-Collector Output 4	Same as Input 1
8	RS232_RX2	I	Receive Data (COM2)	EIA-RS232 Level
9	GND	G	Ground	
10	Microphone +	P	Microphone Positive Signal	
11	Automotive Input	I	Digital Input 6	Same as Input 1
12	Automotive Input	I	Digital Input 7	Same as Input 1
13	Automotive Input	I	Digital Input 5	Same as Input 1
14	Automotive Input	I	Digital Input 3	Same as Input 1
15	CAN 1 L	I/O	CAN 1 Low Signal	
16	O.C. Output	O	Open-Collector Output	Same as Output 1
17	RS232_CTS1	O	CTS (COM1)	EAI-RS232 Level
18	GND	G	Ground	
19	Microphone -	N	Microphone Negative Signal	
20	RS232_RTS1	I	RTS1 (COM1)	EAI-RS232 Level
21	RS232_TX2	G	Ground	EAI-RS232 Level
22	CAN 2 H	I/O	CAN 2 High Signal	
23	CAN 2 L	I/O	CAN2 Low Signal	
24	J1708 +	P	J1708 Positive Signal	
25	J1708 -	N	J1708 Negative Signal	
26	SWC	I/O	CAN	

8. SmarTab 8 Cradle Installation

Mechanical Installation

Mounting Arm

The rear panel of the Micronet SmarTab 8 cradle provides the mechanical infrastructure for a RAM® mount arm installation.

The RAM® mounting arm is a flexible, rotating, arm-based mount that provides a wide range of fixed in-cabin positions for maximum comfort and visibility. The mounting arm screw positions on the cradle rear panel are compatible with Amp's standard mounting-arm products.

NOTE:
A qualified installation technician must provide In-vehicle installation instructions.

Mounting Inserts Location and Dimensions

There are two M5 thread mounting PEM Screw Inserts found on the rear panel of the Micronet SmarTab 8 cradle. The distance between the PEM screw inserts is 48.50mm.

Micronet provides two screws with the RAM® mounting arm (RAM® P/N RAM-B-138U) in the Micronet SmarTab 8 DTK. If you source the RAM mount arm or another mounting arm brand by yourself, you must take in account the Mounting Arm Ball Base Adapter base thickness when calculating the screw thread length.

Figure 14: Micronet SmarTab 8 Enhanced Cradle Rear Panel Mounting Arm Screw Inserts

PEM Screw Inserts

The following parameters present the calculation of the screws and PEM screw insert dimensions:

1. M5 thread
2. PEM thread length 6.6 mm
3. Screw length 5.5 mm + Mounting Arm Ball Base Adapter depth

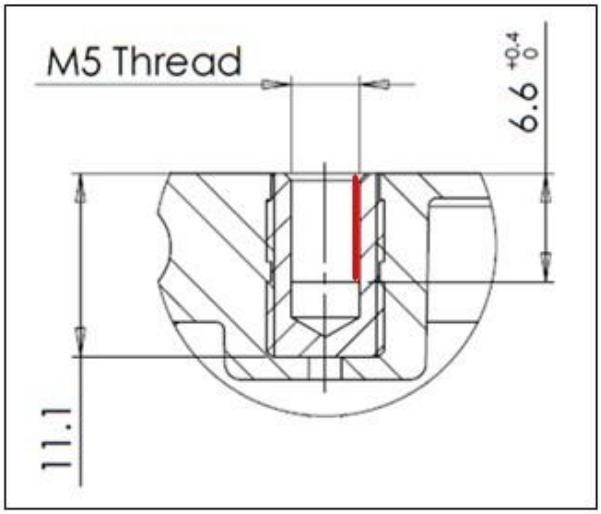

Figure 15: Micronet SmarTab 8 Cradle Rear Panel Mounting Arm PEM Screws Inserts Dimensions

Mounting Arm Ball Base Adapter

Figure 16: Mounting Arm Ball Base Adapter thickness

Device Installation Steps

1. Determine the optimal positioning of the Micronet SmarTab 8 cradle in the vehicle that provides easy access and a clear view of both the road and the display.
2. Attach the base of the mounting-arm assembly to the dashboard or cabin.
3. Attach the mounting arm to the cradle rear panel using the mounting screw inserts.
4. Connect the Micronet SmarTab 8 cradle with the mounting arm to the mounting arm base.
5. Follow the power cable preparation as described in Electrical Installation.

Electrical Installation

Vehicle Battery Connection

The Micronet SmarTab 8 input power connects directly to the vehicle's battery. See the Electrical Installation in Figure 17 below.

The supported nominal battery voltage supply is 12V or 24V DC, with an operating range between 8V to 30V DC.

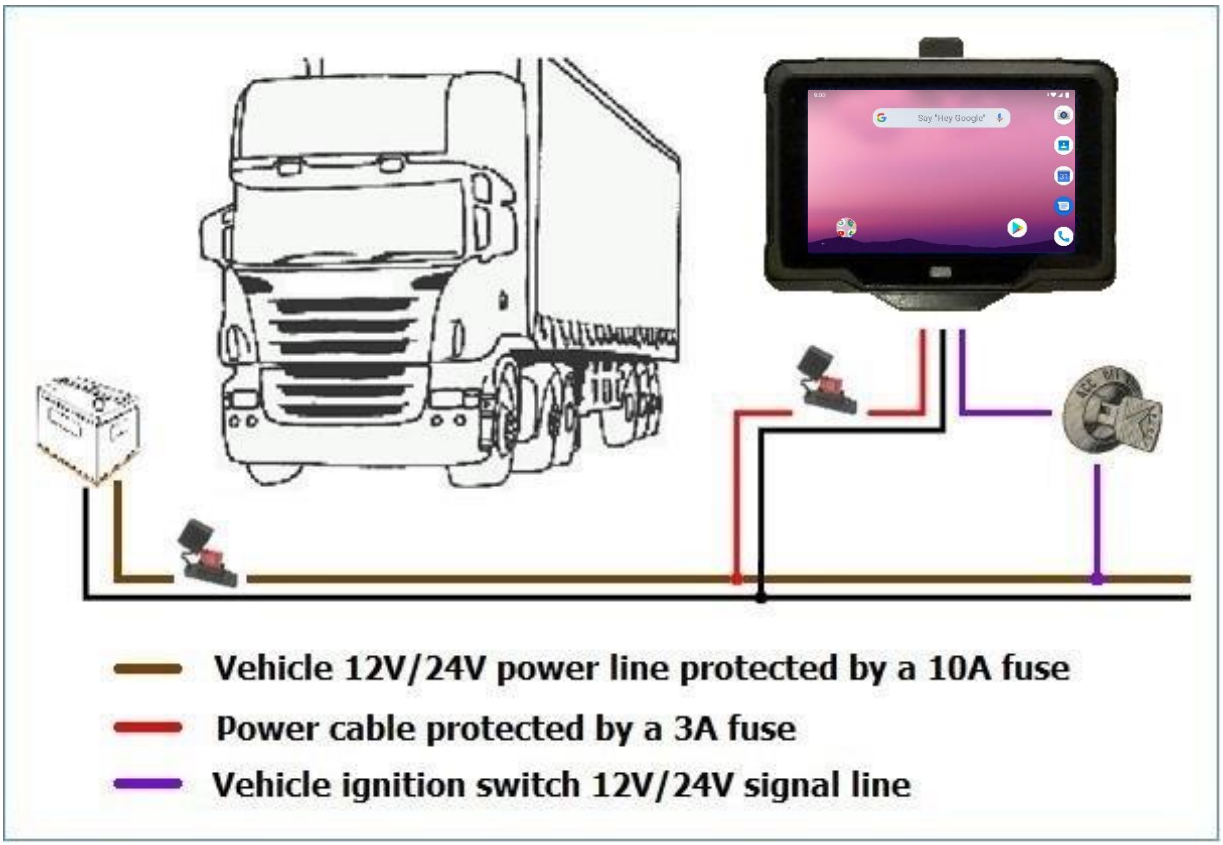

Figure 17: Electrical Installation Scheme Electrical Installation Procedure

1. Prepare the wiring for power, ground, and ignition switch in the vehicle for connecting to the Micronet SmarTab 8 cradle cable.
2. The power signal connects to the vehicle's power line protected by a 10A fuse. Add an inline 3A "Slow Blow" fuse with a fuse holder for HHC/HHD blade-type fuses to the power cable.
3. The ground signal connects to the vehicle's ground line.
4. The ignition input signal connects to the vehicle's ignition switch line.
5. Fix the cable after verifying that all the functions are performing correctly.
6. Arrange the cables using a plastic strip.

The cradle must be connected to power before inserting the Micronet SmarTab 8 into the

cradle. If the Micronet SmarTab 8 is inserted while the cradle is not connected to power, the

Micronet SmarTab 8 shuts down immediately.

9. Insertion to Cradle (Basic Only)

Inserting the Tablet into the Cradle

1. Hold the Micronet SmarTab 8 on top and insert it into the cradle.

2. Push the Micronet SmarTab 8 on top against the cradle until you hear the click.

Removing the Tablet from the Cradle

1. Pull the latch knob on top of the cradle.
2. Pull out the SmartTab 8 of the cradle.

10. Physical Characteristics

Table 8: Physical Characteristics

Dimension	Measurement	
Micronet SmarTab 8 Portable		
Width	8.85 inch	225 mm
Height	5.91 inch	150 mm
Depth	0.70 inch	18 mm
Weight	24.69 oz.	0.7 Kiligrams
Micronet SmarTab 8 Fixed		
Width	8.85 inch	225 mm
Height	5.91 inch	150 mm
Depth	1.41 inch	36 mm
Weight	28.21 oz.	0.8 Kiligrams
Micronet SmarTab 8 with Basic or Enhanced Cradle		
Width	9.05 inch	230 mm
Height	7.08 inch	180 mm
Depth	1.37 inch	35 mm
Weight	12.34 oz.	0.35 Kiligrams

11. Known Issues

Overview

The Micronet SmarTab 8 has some known issues discovered in the alpha launch and pre-production testing. These are listed below:

SD Card Format Error:

1. **BUG** – When an SD Card is inserted to the SmarTab 8, the Android OS attempts to format it as "Internal" (application) storage, which fails and displays “Not Supported” (This is a specific version limitation).

2. **WORKAROUND (temporary)** – To use the "External" (data storage) of the SD card, we recommend formatting it externally on a PC as FAT32 file system before inserting the SD card to the Micronet SmarTab 8 device. Doing this will ensure the correct behavior of the SD card as external storage.

12. Compliance Information

FCC Compliance:

FCC Compliance Statement: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference, and 2. This device must accept any interference received, including interference that may cause undesired operation. This device must accept any interference received, including interference that may cause undesired operation. Product that is a radio transmitter is labeled with FCC ID.

FCC Caution:

(1)Exposure to Radio Frequency Radiation. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

(2)Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

(3)This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

(4)Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

(5) The modules FCC ID is not visible when installed in the host, or

(6) if the host is marketed so that end users do not have straight forward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module: Contains Transmitter Module FCC ID: U8O-A9 or Contains FCC ID: U8O-A9

IC Canada Compliance:

Notes(IC)
(EN)This device complies with the applicable industry Canada) License exempt radio apparatus, the operation is authorized under the conditions as follows: (1) this device may not cause interference, and (2) the user of this device must accept any interference caused, even if the interference is likely to affect its performance.
(FR)Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

(EN)Radio frequency (RF) Exposure Information The radiated output power of the Wireless Device is below the industry Canada(IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized. The device has also been evaluated and shown compliant with the IC RF Exposure limits under mobile exposure conditions.(antennas at least 20cm from a person's body)
(FR) informations sur l'exposition de radiofréquences (rf) la puissance de rayonnement de l'appareil sans fil est inférieure à la fréquence radio d'industrie canada (ic) limites d'exposition.l'appareil sans fil devrait être utilisé de façon telle que le potentiel de contact pendant le fonctionnement normal est réduit au minimum. le dispositif a été évalué et qui semble conforme à l'ic des limites d'exposition aux rf sous des conditions d'exposition mobile. (antennes d'au moins 20 cm du corps d'une personne)

(EN)The following statement must be included with all versions of this document supplied to an
OEM or integrator, but should not be distributed to the end user. This device is intended for OEM integrators only.
Please See the full Grant of Equipment document for other restrictions
(FR) l'énoncé suivant la déclaration suivante doit être incluse dans toutes les versions de ce document fourni à un oem ou intégrateur, mais ne devrait pas être distribuées à l'utilisateur final. ce dispositif est destiné aux intégrateurs de oem. voir le document de subvention d'équipement d'autres restrictions
(EN) The Innovation, Science and Economic Development Canada certification label of a module shall be clearly visible at all times when installed in the host product; otherwise, the host product must be labelled to display the Innovation, Science and Economic Development Canada certification number for the module, preceded by the word "Contains" or similar wording expressing the same meaning, as follows: Contains IC: 12186A-A9
where 12186A-A9 is the module's certification number
(FR)L'étiquette de certification d'un module d'Innovation, Sciences et Développement économique Canada doit être clairement visible en tout temps, une fois installée dans le produit hôte. sinon, le produit hôte doit porter une étiquette indiquant le numéro de certification d'Innovation, Sciences et Développement économique Canada du module, précédé du mot "contient" ou d'un libellé similaire exprimant le même sens, comme suit:
Contient IC: 12186A-A9 où 12186A-A9 est le numéro de certification du module

EU Regulatory Conformance:

The manufacturer hereby declares that this device is in compliance with the essential requirements and other relevant provisions of Radio Equipment Directive 2014/53/EU.

The device is restricted to indoor use only when operating in the 5150 to 5350 MHz frequency range.

AT	BE	BG	HR	CY	CZ	DK
EE	FI	FR	DE	EL	HU	IE
IT	LV	LT	LU	MT	NL	PL
PT	RO	SK	SI	ES	SE	UK

WWAN	Supports Bands(MHz) GSM850:TX 824-849,RX 869-894 PCS1900:TX 1850-1910, RX 1930-1990 WCDMA BAND II:TX 1850-1980,RX 1930-1990 WCDMA BAND IV: TX 1710-1755, RX 2110-2155 WCDMA BAND V:TX 824-849,RX 869-894 LTE Band 2:TX 1850-1910,RX 1930-1990 LTE Band 4:TX 1710-1755,RX 2110-2155 LTE Band 5:TX 824-849,RX 869-894 LTE Band 7:TX 2500-2570,RX 2620-2690 LTE Band 12: TX 698-716,RX 728-746 LTE Band 13: TX 777-787,RX 746-756 LTE Band 17: TX 704-716,RX 734-746	Max Power 32 dBm 32 dBm 23 dBm 24 dBm 24 dBm 24 dBm 23 dBm 25 dBm 23 dBm 23 dBm 24 dBm 24 dBm
WLAN	Frequency(MHz): 2400-2462, 5150-5250; 5725-5850	Max Power 19 dBm 14 dBm 14 dBm
BT	Frequency(MHz):2402-2480	Max Power 8 dBm