

# X-One PLUS<sub>MOT</sub> Mobile Data Terminal

 Windows Embedded  
Compact 7



# X-One PLUS<sub>MOT</sub>

# X-One Plus<sub>MDT</sub>



# Technical Specifications



## DUAL CPU

Primary CPU Freescale ARM CORTEX A8 iMX 53 1,2 GHz processor Hw Graphic accelerator, open GL Hardware for 3D navigation and the ARM architecture allows this Device to supply a remarkable flexibility and efficiency in computing power, together with reduced power consumption. Secondary CPU AITP (Automotive Intensive Task Processor) supplies the necessary functionalities in the automotive field, like power management, Safe Shutdown, Wheel Pulses Odometer, Distance and Speed calculation, Wake-Up on Ring, Over-the-Air services for software and firmware updates. The AITP is OTA programmable for remote automatic firmware upgrade, and is always powered ON; it can turn-ON and OFF the Device and all its peripherals.

## IDEAL FOR FLEET MANAGEMENT AND JOB DISPATCHING

The Device represents the state-of-the-art device for job dispatching and fleets management, an ALL-IN-ONE powerful and compact solution. Its modem GPRS/EDGE/UMTS allows very reliable communication with operating headquarters. The vehicle is located by the high performance GPS receiver, and compatible with the new European positioning system GALILEO.

Both GPS and GPRS modules can be powered ON and OFF regardless of Windows CE status.

An Hardware MUX Port is available which allows to send AT commands to the modem while the device is connected in GPRS/3G, for example to request connection status, signal diagnostic and modem statistics.

## CUSTOMIZABLE USER INTERFACE

The 7 inches 16:9 clear readable TFT Displays with 800x480 resolution allow to develop versatile and high accessible applications, thanks also to the integrated TouchScreen controller, and to the 6 keys with LEDs available.

Hardware Keys avoid consumption and damage of Touch Screen for heavily used operations.

The ambient light sensor allows to choose an optimal brightness of the display in any environmental light.

The power key is a Smart Power Button, completely programmable and used to perform several important tasks such as:

- normal press to start from System Disk
- long press to start from microSDHC Card
- long press to Shutdown CE safely

Can be also disabled or programmed to trigger Ghost Mode (fake shutdown).

## DOUBLE BOOT FEATURE

Through this powerful functionality is possible to restore and to update the entire system anytime, starting from user application up to the complete operating system and all the CPU firmware.

The system is able to boot from two different disks:

- 2 microSDHC for large data storage (large maps, images, movies, logs) and for service (system initialization or restore).

## STEALTH MODE

Stealth mode is a special operating mode in which the system is working but the display is OFF.

This feature can be useful in several situations:

- Driver Control: System has also the wake up on ring feature, so at the central it is possible to remotely turn-ON the device (also in stealth mode so nobody can see that it is starting) in order to check vehicle position, internal audio listening and other data.
- Ghost Mode: It is possible to set the device so that after pressing the shut down but on the system goes on stealth mode instead of turning OFF. This feature is useful if you want the device to remain always ON (it turns OFF only the display, reducing power consumption) or in an alarm situation.
- Alarm managing: If system is OFF and alarm but on is pressed the system can be started in stealth mode, so nobody can see that the system starts. On this special start the system can be programmed for example to send an alarm message to the central, GPS position or also screenshots or audio..

## INPUTS AND OUTPUTS

The Device supplies a wide range of communication channels with the external environment: three Hi-Speed USB 2.0 Host, one USB Device and up to 7 Serial Ports.

The special programmable digital inputs and outputs allow to control devices and read signals coming from generic external equipments.

## RGB analog video Camera input, with Infra Red power management

# Technical Specifications

## Display

Viewing area 7" diagonal

Aspect Ratio 16:9

WVGA 800x480 Resolution

Colour TFT LED Display

Display clearly viewable with 600 cd/m2

Ambient Light Sensor with 32 Steps Automatic Regulation

Secondary Interactive Display with independent content

## Touchscreen

Automotive Full Rugged Pen/Finger Resistive Touchscreen.

Extended Temperature Range

## Main Features

ARM architecture, fan-less, all-in-one device.

Primary CPU Freescale CORTEX A8 iMX 53  
1,2 GHz processor Hw Graphic accelerator, hardware based open GL for 3D navigation

Independent Secondary CPU for Automotive Intensive Tasks (AITP).  
The secondary CPU is always working, even when Windows is powered off

Hardware Watch Dog  
Important feature that allows the device reboot in case of application crashes

RTC  
Real Time Clock with calendar is provided

On-Board Peripherals Power Management with API  
Each peripheral (GPS, GPRS, Bluetooth..) can be powered on and off programmatically through a dedicated API, in order to optimize the power consumption when the peripheral isn't necessary

Accelerometer  
The internal accelerometer can be used for odometer anti-tamper detection, GPS anti-tamper detection, harsh turn, acceleration and brake detection, car tilt detection

Professional Automotive Connectors and Wirings  
Automotive connectors designed specifically for use in automotive systems

## Ram Memory

256MB up to 1GB RAM Memory

## Storage Memory

2 x microSDHC up to 32 GB (High Capacity compatible) socket

## Communication Modem

On-board 3G HSUPA Modem

Modem can be powered on when the terminal is off.

2 Sim Card slots with Software switcher available through API calls  
(Dual SIM switcher can be used to change telecom operator in case of signal loss or roaming related issues)

Support international standard protocol (ETSI AT command set)

Supports RAS (Remote Access Service) dialup function

GPS / GPRS /3G Rugged Combo antenna (option)

Wake-up on ring programmable features.  
Through this feature is possible to remotely turn ON the device (also in stealth mode so nobody can see that it is starting) in order to check vehicle position, internal audio listening and other data.

Warm reset and cold reset (dedicated electronic circuit) available through API calls

1 USB, 1 Hardware RS232 Serial Ports available on the modem  
(Hardware MUX Port allows to send commands to the modem while the device is connected in internet, for example to request connection status, signal diagnostic and modem statistics, to send and receive SMS, to manage voice calls).

## GPS Receiver

On-board 56 Channel GPS, Galileo compatible, with anti-Jamming, precision 2m CEP SBAS, cold start 29 s.

Antenna Monitor (Disconnection and Short Circuit Detection / Protection)

Supports international NMEA standard format and proprietary UBX Binary protocol

Assisted GPS (A-GPS) available

Dead Reckoning (option)

## RF-ID module

On-board RF-ID module integrated on the device

RF-ID is compatible with 13.56MHz, Mifare 1 K/4K, Mifare Ultralight, ICODE2, MF1 IC S50, ISO14443, TAG-IT HF-I (TI), EM4135 (MEM), LRI 64 (STM), LRI 512 (STM), SR176 (STM), MB89R118 (FUJITSU)

## USB Ports

3 x USB 2.0 Host (with USB Support for Mouse and Keyboard) Hi-Speed

1 USB Client

## Programmable Hardware Keys with LEDs

6 x Hardware Buttons avoid consumption and damage of Touch Screen for heavily used operations

## Smart Power Button

The power key is a Smart Power Button, completely programmable and used to perform several important tasks.

## Serial Ports

1 External Full Modem RS232 Port

2 External TX/RX RS232 / RS485 Port

4 External RS232 Serial Ports (option)

All the ports are ESD Protected for automotive usage.

## I/O ports connection

4 Digital Inputs

3 + 5 Power Output Ports

4 Analog Input Ports

Dedicated Engine Input (the Engine input can be used to automatically Power ON/OFF the system according to the Engine Key Status)

Odometer Input (this feature allows to track the distance covered and the real time speed using an independent wheel pulse input)

2 x CAN Interface (can be connected to CAN V2.0 network with FMS Standard and CiA 447 protocols).  
This interface is very important especially on modern vehicles, where the odometer pulsed signal is no more available

External Speaker output

External Microphone input

### Alarm and Security

Dedicated Panic Button input / Emergency Switch input

Stealth Mode Controller (Stealth mode is a special operating mode in which the system is working but the display and audio are OFF)

RGB analog video Camera input, with Infra Red power management

### Stealth Display Feature

Fully Programmable Stealth display mode, Screen saver mode and sleeping mode by Power Button - Hardware Keys - API

Enable Switching Off LCD without powering down MDT unit.

### Multimedia

Internal and external Speaker and Microphone with hand free

The audio channel selection (Windows line and microphone or GSM phone) can be done programmatically through a dedicated API

Supports wave speaker volume control

API provided

Playback wave and speech files

### Boot

Dual-Boot feature for emergency recovery from Flash Disk or External Memory

It's possible to restore and update the entire system any time up to the complete operating system and all CPUs firmware

Dual Boot available from 2 microSDHC Card

Boot Time < 12 sec

Customizable Boot Up Splash Screen with End-User Logo

### Soft/Hard Reset

Soft Reset available through HW switch

Soft Reset available through API calls

Hard Reset available through microSDHC Card (Factory default)

### Connectivity

Ethernet: 10/100 Mbps LAN Controller

Wi-Fi client 802.11b/g/n (option)

Bluetooth class 2 (option)

### Safe Windows shutdown procedure.

Preshutdown notification  
(The operating system sends a pre-shutdown notification signal to all running applications that can safely save their data before closing)

Disk Activity Signal Control (avoids system shutdown while the system memory is working)

### Operating System

Windows Embedded Compact 7 with ATL, MFC, .NET Compact Framework 3.5 and Digitax Framework 4.1

### Development Tools

ActiveSync 4.5 (last version available) and USB debugging with ActiveSync support

SDK for Embedded Visual Studio 2008 / 2005

Sample code for SDK in C++

Digitax Framework 4.1 (Digitax Libraries): GPS, GPRS, VoiceCall, I/O, Odometer, Taximeter, Hardware Keys, WatchDog, OTA, Windows Status, Stealth Mode Controller, Logs, Backup And Restore, Light Dimmer, Hardware Identification, Splash Screen, Alarm, Card Reader and Windows Status

Read/Write Windows CE registry application and API to Supports permanent saving of system settings into registry

### Text-To-Speech

Support 3rd party Text-To-Speech

### Software Navigation

Support 3rd party map application and navigation software with SDK

### System diagnostic tools

On Field Test (OFT) OnBoard Diagnostic Utilities included, with Customizable CheckList to make tests of GPS Fix, GPS Antenna, GPRS Connectivity and Base Station Signal Quality, Odometer, Ignition, Panic Button, TouchScreen calibration, Hardware Keys, Ambient Light Sensor, Device version, OS Version, AITP Version, Taximeter, UPS and Battery Status, Roof Light, Navigation Software

All On Field Tests and enrolling features can be used during first installation and swap of devices.

### OS Image Loader

Over The Air (OTA) OS image loader or microSDHC Card Image Loader

### System Update Fleet Management

Professional OTA (Over The Air) CLIENT allows the update of the whole Operating System and all the CPUs Firmware (option).

Professional OTA (Over The Air) SERVER with vehicles enrolling, group management and selective update, remote debugging and logging. Web based user interface (option)

### Power Supply

8 - 32 V with Surge Protector

The device is designed to withstand voltage glitches at car start, due to engine crank issues.

Power consumption is 20mA/12V Standby, 600mA/12V maximum.

### Operating Temperature

Extended operating temperature range -20°C / + 70°C

### Humidity

Humidity up to 95% non-condensing.

### Vibration

Vibration Sine wave, 10 ~ 500 ~ 10Hz, 1.5G, 0.37oct/min 3 axis, 1hour/axis.

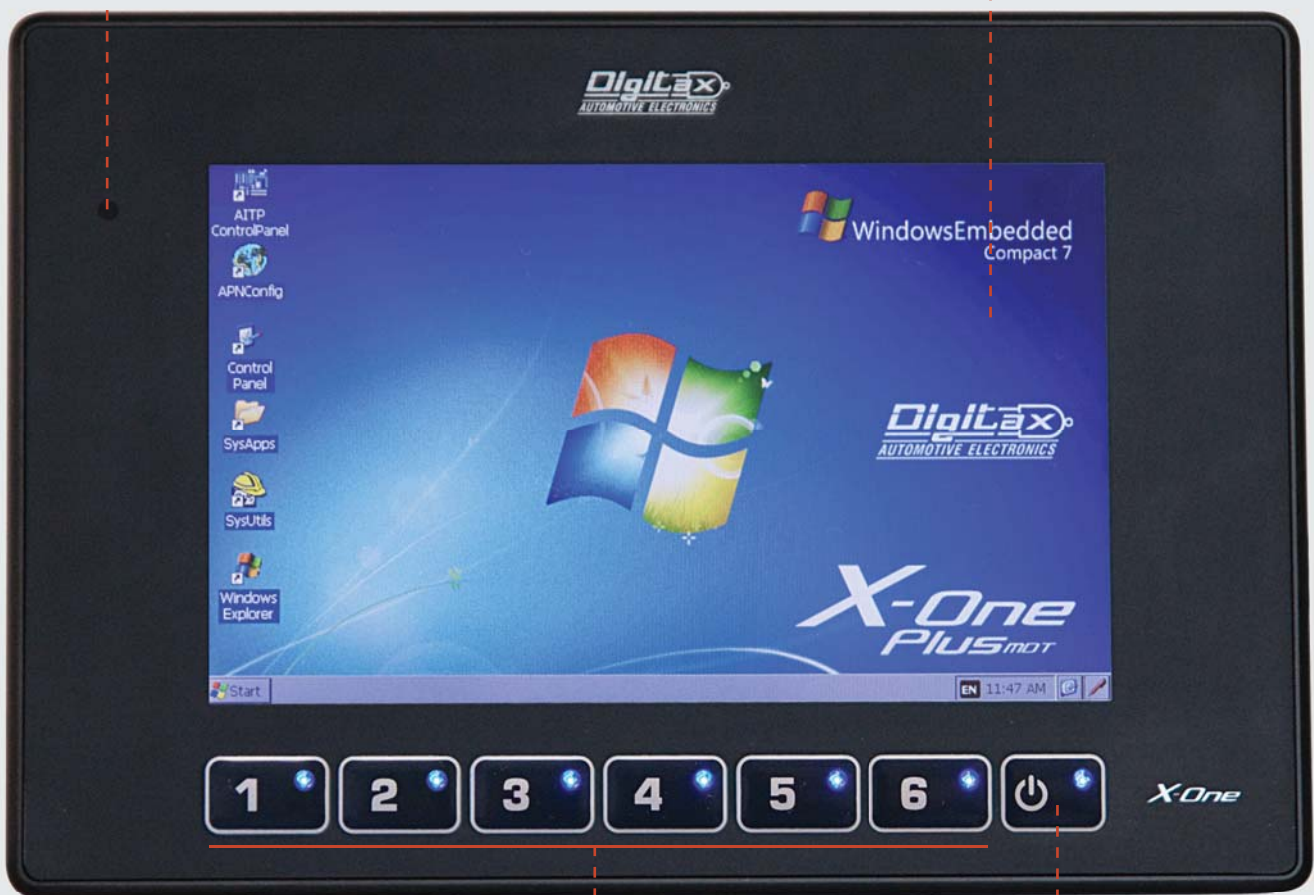
### International Protection Class

IP67

# X-One Plus<sub>MDT</sub>

AMBIENT LIGHT SENSOR

TOUCH SCREEN



FUNCTION KEYS

POWER KEY

BUILT-IN MIC

BUILT-IN RF-ID READER

BUILT-IN SPEAKER

CABLE OUTPUT



# X-One Plus<sub>mot</sub>



## OPERATIVE SYSTEM AND DEVELOPMENT TOOLS

Windows Embedded Compact 7 Operative System and Compact Framework 3.5 combined with the complete Digitax Framework 4.1 allow the developers to create their applications and their services with the maximum simplicity and in very reduced time.



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