

# X-One

Mobile Data Terminal



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# X-One MDT



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## DUAL CPU

Samsung Primary CPU is 400MHz 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 (optionally also UMTS) allows very reliable communication with operating headquarters. The vehicle is located by the high performance GPS U-Blox 5 receiver with 50 channels, 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, for example to request connection status, signal diagnostic and modem statistics.

All the communication and tracking features are assured by the AITP processor even when the Device is powered OFF: the GPS and GPRS modules are managed by the AITP both for power supply and for communication.

## 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 firmwares.

The system is able to boot from two different disks:

- Flash Disk, used for applications and data;
- 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 button 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 button 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.

## HIGH AVAILABILITY

The Device can withstand glitches at car start, or power loss problems thanks to the external UPS Battery system, that is automatically recharged. The AITP processor gives time to user applications and Windows to close gracefully and safely in case of sudden disconnection of the Main Power.

## INPUTS AND OUTPUTS

The Device supplies a wide range of communication channels with the external environment: two USB Host, one USB Device and up to 8 Serial Ports.

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

# Technical Specifications

<b>Display</b>	<b>Dead Reckoning System (GPS + Gyroscope + Odometer) with EKf (Enhanced Kalman Filter) (option)</b>
Viewing area 7" diagonal	GPS / GPRS Rugged Combo antenna (option)
Aspect Ratio 16:9	
WVGA 800x480 Resolution	<b>USB Ports</b>
Colour TFT LED Display	2 USB Host (with USB Support for Mouse and Keyboard)
Display clearly viewable with 350 cd/m2	1 USB Device
Ambient Light Sensor with 32 Steps Automatic Regulation	
<b>Touchscreen</b>	<b>Hardware Keys</b>
Full Automotive Rugged Touchscreen with configurable touch areas.	6 Lighted and Software programmable Hardware Buttons
Extended Temperature Range	
Finger Type	<b>Power on key</b>
	1 Power On/Off button
<b>CPUs</b>	<b>Serial Ports</b>
Fanless Device with Primary CPU Samsung ARM 400MHz	2 Internal RS232 Serial Ports
Secondary M16 CPU for Automotive Intensive Tasks	8 RS232 Serial Ports Available through External DerivBox (option)
	2 RS232 Serial Ports available on embedded meter to connect 2G IU, Printer and Smart Roof sign (Option)
<b>Ram Memory</b>	
128MB RAM Memory	<b>I/O ports connection</b>
	3 Digital Inputs
<b>Storage Memory</b>	3 + 5 Power Output Ports
128MB up to 256MB capacity of Internal Flash Memory	Dedicated Ignition input
microSDHC (High Capacity compatible) socket	Dedicated Emergency Switch input
<b>GPRS Modem</b>	<b>Alarm and Security</b>
GSM / GPRS Class 12	Panic Button input
Modem can be powered on when the terminal is off.	Stealth Mode Controller (system ON display, audio and lightings off)
Wake-up on ring programmable features	
Board to Board connector pin to pin compatible with "GPRS (base)" "EDGE (option)" and "UMTS (option)" retrofit upgradable	<b>Stealth Display Feature</b>
Warm reset and cold reset (dedicated electronic circuit) available through API calls	Fully Programmable Stealth display mode, Screen saver mode and sleeping mode by Power Button - Hardware Keys - API
2 Hardware RS232 Serial Ports available on the modem (Hardware MUX) allow both RAS and AT command from user applications	Enable Switching Off LCD without powering down MDT unit.
2 Sim Card slots with Software switcher available through API calls	
Support international standard protocol (ETSI AT command set)	<b>Multimedia</b>
Supports RAS (Remote Access Service) dialup function	Speaker and Microphone
GPS / GPRS Rugged Combo antenna (option)	Supports wave speaker volume control
	API provided
	Playback wave and speech files
<b>GPS Receiver</b>	
Ublox 5 SuperSense Technology and Indoor Navigation, new generation GPS chipsets with improved precision and fast acquisition of position fix on start up and sleep mode	<b>Boot</b>
50 Channels, 1 Million correlators, GALILEO Compatible	Dual Boot available from Flash Disk and microSDHC Card
Antenna Monitor (Disconnection and Short Circuit Detection / Protection)	Boot Time < 10 sec
- Hot starts: < 1 s	Customizable Boot Up Splash Screen with End-User Logo
- Warm starts: 29 s	
- Cold starts: 29 s	<b>Soft/Hard Reset</b>
Supports international NMEA standard format and proprietary UBX Binary protocol	Soft Reset available through HW switch
Messages interval up to 4 Hz Frequency	Soft Reset available through API calls
Assisted GPS (A-GPS) available	Hard Reset available through microSDHC Card (Factory default)
	<b>Wireless Connections</b>
	National Semiconductor LMX9838 Bluetooth (option)
	Complete Bluetooth 2.0 Stack including



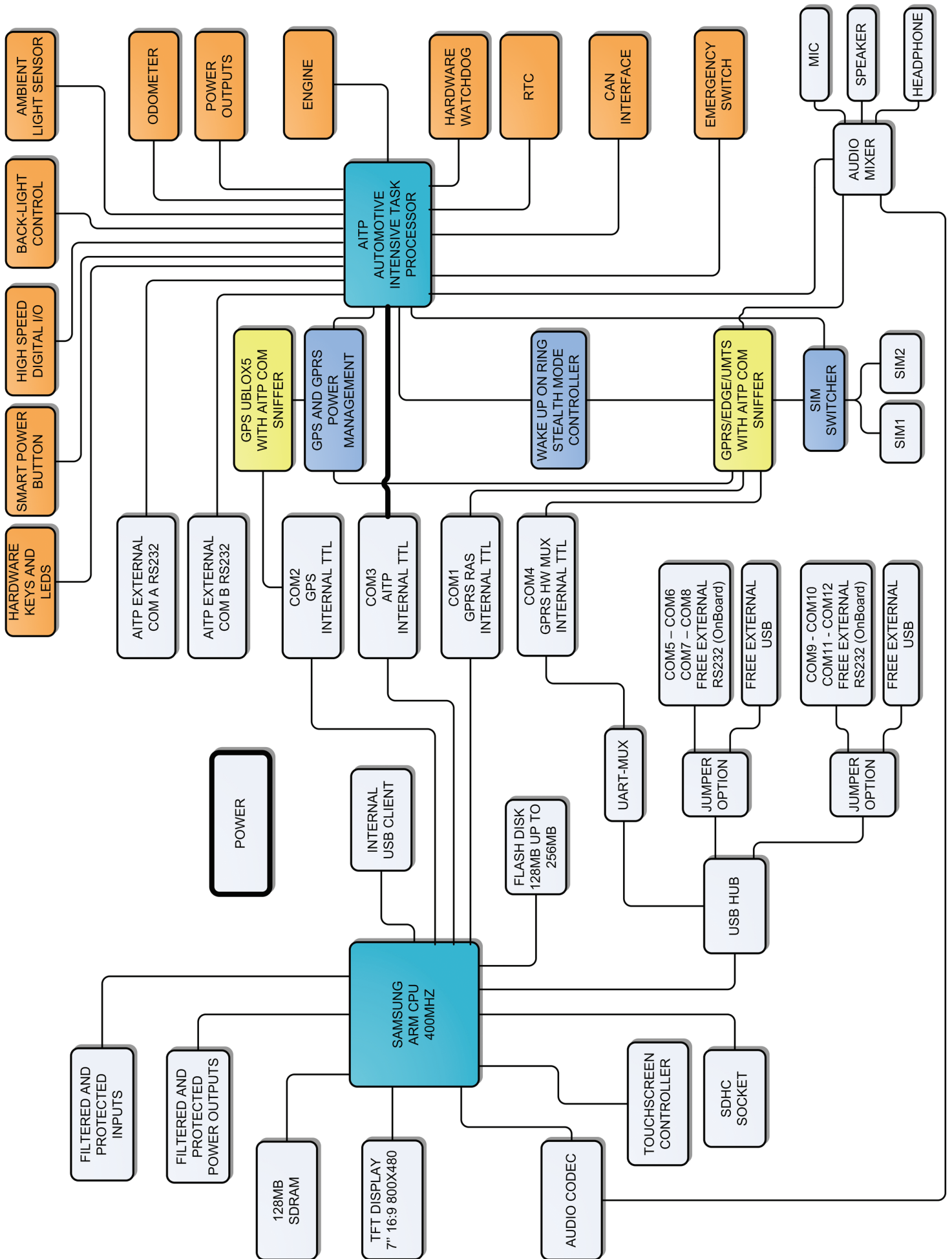
Multimedia
Speaker and Microphone
Supports wave speaker volume control
API provided
Playback wave and speech files
Boot
Dual Boot available from Flash Disk and SDHC Card
Boot Time < 10 sec
Customizable Boot Up Splash Screen with End-User Logo
Soft/Hard Reset
Soft Reset available through HW switch
Soft Reset available through API calls
Hard Reset available through microSDHC Card (Factory default)
Safe Windows shutdown procedure.
Preshutdown notification
Disk Activity Signal Control
External UPS (option)
Operating System
Windows CE .NET 5.0 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 C++ 4.0 (EVC4)
Sample code for SDK in C++
Compact Framework 3.5 supported
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
Serial port driver and test tools
Digital I/O driver, API (DLL) and test tool
Read/Write Windows CE registry application and API to Supports permanent saving of system settings into registry
Software controllable Warm Restart and test tool
GPRS modem driver and test tool
GPS driver and test tool
Speaker and MIC test tool, wave playback and voice recorder
Contactless / NFC reader driver and test tool
Backlight control API and test tools
Ping tool
Dialup network
GSM phone dialer
Support network protocol TCP/UDP, IP, PPP
Virtual keypad
Text file editor

Explorer
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)
Taximeter
Embedded Taximeter (Full Firmware and TARIF OTA Programmable)
Power Supply
8 - 32 V with Surge Protector
Battery
External UPS Battery Package, Standard Battery Pack 1 hour (option)
Mounting
All the External Connectors, Accessible slots (such as SIM Card, SDHC, USB, etc.) and Screws are Sealed
Operating Temperature
-20°C to 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.
Dust Ingress Protection
All connectors covers sealed, no open holes
Dimension
204 mm x 120 mm x 35 mm (H x W x D)
Weight
545 g



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# Block Diagram





## OPERATIVE SYSTEM AND DEVELOPMENT TOOLS

Microsoft Windows CE .NET 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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