4GMCU

Mobile Control Unit and M2 display

Microsoft Windows CE

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The Most Powerful MCU available in Market

- Main CPU and Companion Chipset 500 MHz - 1 GHz - 1,5 GHz
- X86 Architecture
- Multi OS Support: Win CE6 - XPe - XP Pro - Linux
- Secondary CPU for automotive intensive task

Digitax AUTOMOTIVE ELECTRONICS

4GMCU

7” M2 Display

4GMCU Mobile Control Unit

DUAL CPU

VIAC7 Primary CPU is: 500MHz - 1Ghz - 1.5GHz with CX 700 Companion chipset and the x86 architecture allows this Device to supply a remarkable flexibility and efficiency in computing power.
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, a separate CPU – Display powerful 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.

POWER KEY BEHAVIOR

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 Hidden Disk or SDHC Card
- long press to Shutdown CE safely

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

TRIPLE 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 three different disks:

- Flash Disk, used for applications and data, visible by WinCE
- Protected Hidden Disk, used for emergency boot, write protected with hardware signal, against undesired writings and not visible or accessible by Windows CE, even in case of crashes.
- SDHC 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 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 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.

VIDEO GRABBER

A Build-In RGB Video Grabber Input can be used to acquire Analog video streaming and save images coming from a security camera, or to show real time fluid videos (Full screen or window overlay mode).
A Device digital output is dedicated to power-ON the camera and its IR LEDs if needed.
After connecting an external source, videos can be shown on a secondary VGA display, for example for advertising or leisure.

Technical Specifications

Display
Separate CPU Unit and LCD Display
Viewing area 7” diagonal
Aspect Ratio 16:9
WVGA 800x480 Resolution
Colour TFT LED Display
Display clearly viewable with 350 cd/m2
Ambient Light Sensor with 32 Steps Automatic Regolation

Touchscreen
Full Automotive Rugged Touchscreen with configurable touch areas.
Extended Temperature Range
Finger Type

CPUs
Primary CPU VIAC7 x86 500MHz up to 1.5 GHz
CX700 Companion Chipset
Additional processing power for 3D graphics, multimedia, and streaming functions
Secondary RISC CPU for Automotive Intensive Tasks
Automatic and Programmable Fan control with Internal Temperature Sensor and PWM Driver

Ram Memory
256MB up to 1GB RAM Memory

Storage Memory
256 MB up to 4 GB capacity of Internal Flash Memory
128 MB Protected Hidden Disk (Soldered Flash Disk, available with WinCE version) Bootable
SDHC (High Capacity compatible) socket

GPRS Modem
GSM / GPRS Class 12
Modem can be powered on when the terminal is 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
Warm reset and cold reset (dedicated electronic circuit) available through API calls
2 Hardware RS232 Serial Ports available on the modem (Hardware MUX) allow both RAS and AT command from user applications
2 Sim Card slots with Software switcher available through API calls
Support international standard protocol (ETSI AT command set)
Supports RAS (Remote Access Service) dialup function
GPS / GPRS Rugged Combo antenna (option)

GPS Receiver
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
50 Channels, 1 Million correlators, GALILEO Compatible
Antenna Monitor (Disconnection and Short Circuit Detection / Protection)
- Hot starts: < 1 s
- Warm starts: 29 s
- Cold starts: 29 s
Supports international NMEA standard format and proprietary UBX Binary protocol
Messages interval up to 4 Hz Frequency
Warm reset and cold reset (dedicated electronic circuit) available through API calls
Assisted GPS (A-GPS) available
Dead Reckoning System (GPS + Gyroscope + Odometer) with EKF (Enhanced Kalmann Filter) (option)
GPS / GPRS Rugged Combo antenna (option)

USB Ports
2 USB Host (with USB Support for Mouse and Keyboard)

Wireless Connections
Built-in Bluetooth EZURIO Bism2 (option)
Class 1 Bluetooth version 2.0
Range in excess of 300 metres and Data transfer rate up to 300 kbps

Hardware Keys
6 Lighted and Software programmable Hardware Buttons

Power on key
1 Power On/Off button

Serial Ports
4 Internal RS232 Serial Ports
4 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)

I/O ports connection
5 Digital Inputs
2 Analog Inputs
4 Power Output Ports
Dedicated Ignition input
Dedicated Emergency Switch input
1 PS2 Keyboard Connector
LAN Connectivity for debug and development (option)
Video Grabber RGB Composite Input Port

Alarm and Security
Panic Button input
Stealth Mode Controller (system ON display, audio and lightings off)

Stealth Display Feature
Fully Programmable Stealth display mode, Screen saver mode and sleeping mode by:
- Power Button
- Hardware Key
- API
Enable Switching Off LCD without powering down MDT unit.

Multimedia

Speaker and Microphone

Supports wave speaker volume control

API provided

Playback wave and speech files

Boot

Triple Boot Manager (Flash Disk, SDHC Card, Hidden Protected Disk) with FileSystem Integrity Check, OTA Application update, Peripheral GPS and GPRS Power Management

Boot Time 35 sec

Customizable Boot Up Splash Screen with End-User Logo

Soft/Hard Reset

Soft Reset available through HW switch

Soft Reset available by API calls

Hard Reset available by Hidden Protected Disk or SDHC Card

Safe Windows shutdown procedure.

Preshutdown notification

Disk Activity Signal Control

On-Board UPS

Operating System

WinCE .NET 6.0 or Windows Embedded Standard / Windows XPe, 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

On-Board UPS with External Battery Package, Standard Battery Pack 30 minutes

Mounting

All the External Connectors, Accessible slots (such as SIM Card, microSDHC, 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

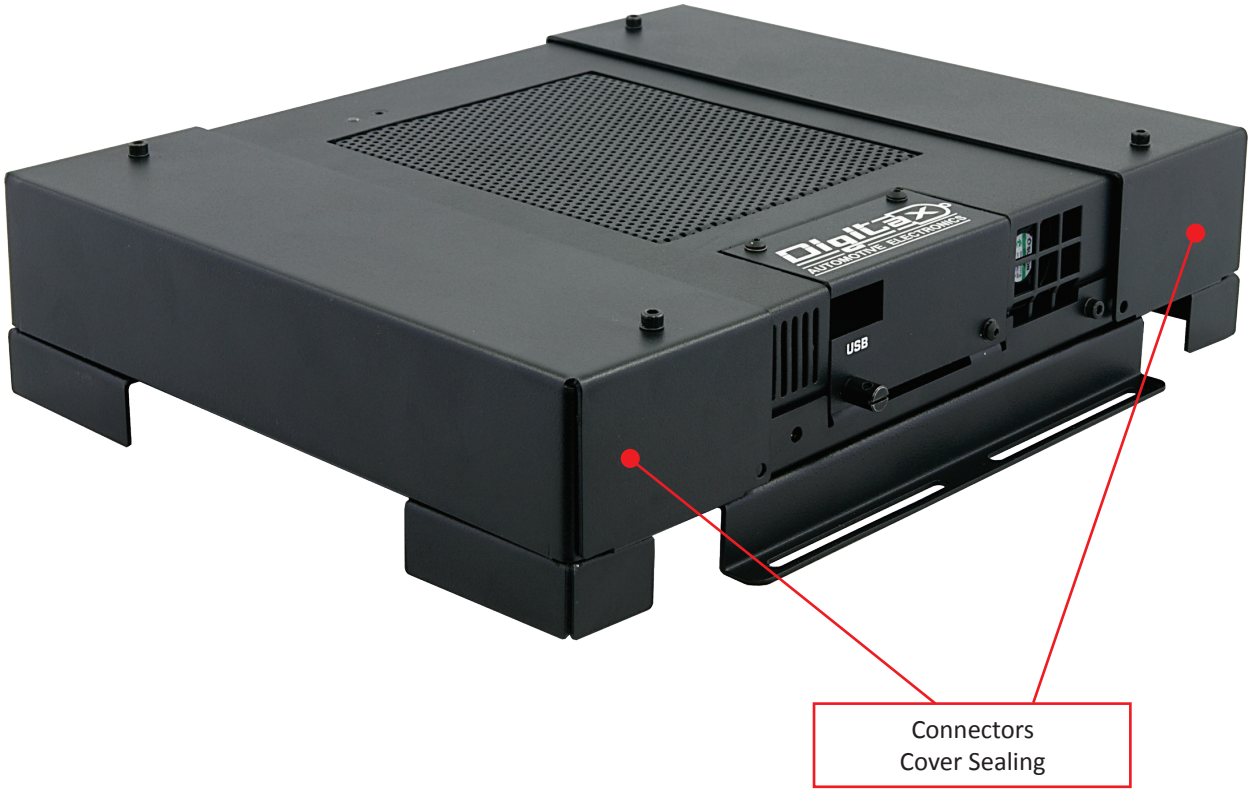
Dimension

224 mm x 177 mm x 45 mm (H x W x D)

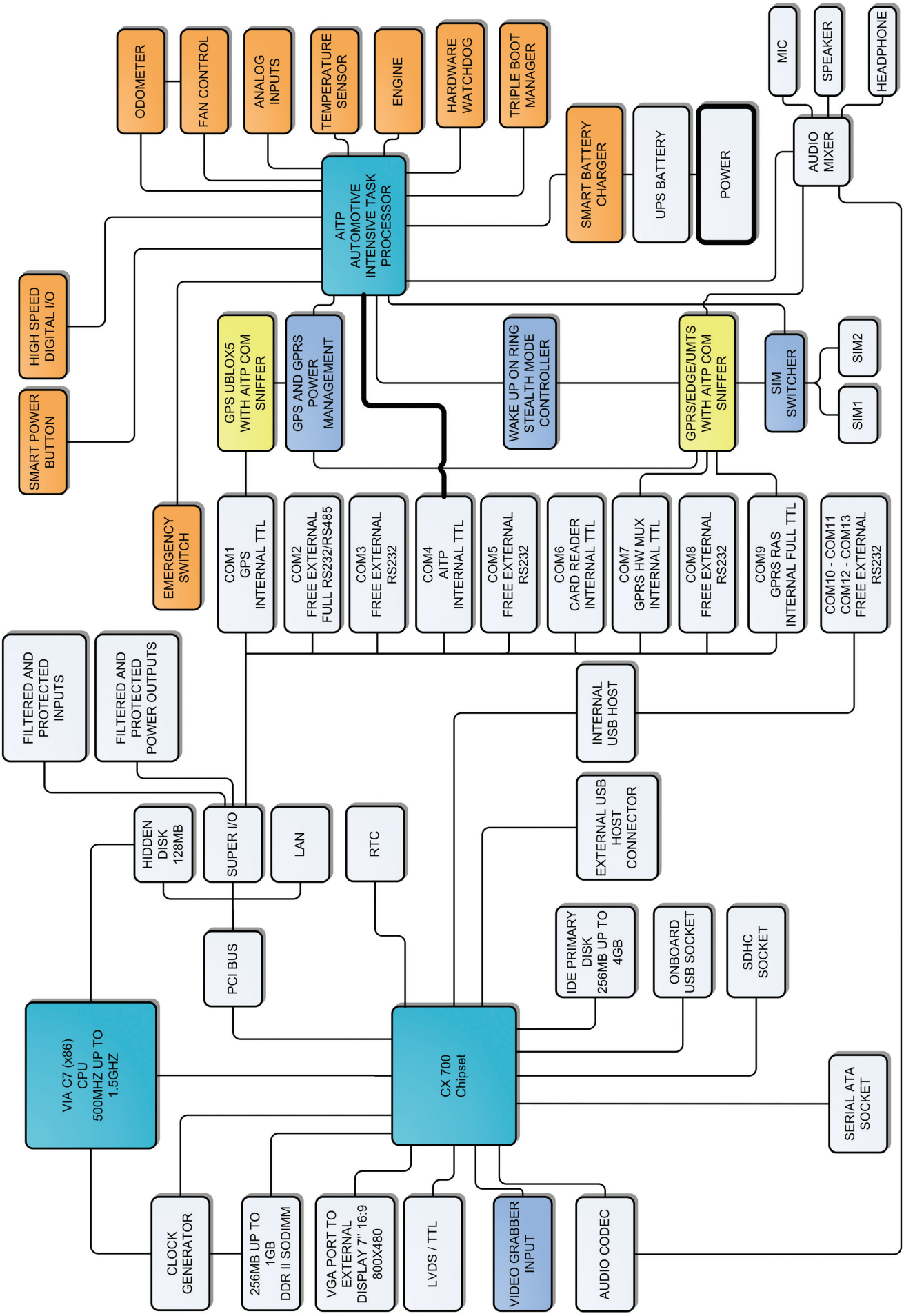
4GMCU


GPRS
GPS
COM8
COM2
COM5
COM3


USB
POWER
MONITOR
VGA
PS2
RGB
AUDIO
I/O POWER SUPPLY


USB
Connectors
Cover Sealing

Block Diagram



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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.

Digitax Italy Headquarter
Via dell'Industria 16 - 62017 Porto Recanati (MC) - ITALY
Phone +39 071 7590984 r.a. - Fax +39 071 9797405
E-mail info@digitax.com - Web www.digitax.com

Digitax España

C/Tanger, 58 (zona 22@)
08018 Barcelona
SPAIN
Phone +34 934 863 835
Fax +34 934 863 836
Web: www.digitax-es.com
E-mail: info@digitax-es.com

Digitax Electronincs U.K.

Smokehouse, 31
Tanners Bank North Shields
Tyne & Wear NE 30 1 JH
ENGLAND
Phone +44 (0191) 296 1294
Fax +44 (0191) 257 8438
Web: www.digitax.net
E-mail: digitaxuk@aol.com

Digitax Deutschland

Taxitech Handelsges. mbh
Sommerkamp 31a - 22335
Hamburg
GERMANY
Phone +49 40 555 05540
Fax +49 40 555 05530
Web: www.digitax-de.com
E-mail: digitax@taxitech.de

Digitax Nederland B.V.

Postbus 84112
3009 CC ROTTERDAM
HOLLAND
Phone +31 10 4512121
Fax : +31 10 4500453
E-mail: h.wittenberg@
planet.nl
E-mail: info@digitax.nu

Digitax CO. Mauritius

P.O. box 775
Bel Village
MAURITIUS
Phone +230 234 4533/4936
Fax +230 234 5866
Web: www.mtl-co.net
E-mail: mtlts@intnet.mu