

# 4GMCU+

Mobile Control Unit and M2 display



index

Main Page

General concepts  
& architecture

Technical

Specifications

Development Tools

## The Most Powerful MCU Car PC available in Market

- Main CPU and Companion Chipset 500 MHz - 1 GHz - 1,5 GHz
- X86 Architecture
- Microsoft Windows Embedded Standard O.S.
- Secondary CPU for automotive intensive tasks
- Up to 3 Channels Video Grabber (H264 and MPEG compressions)

# 4G MCU+



7" M2 Display

## DUAL CPU

The VIAC7 Primary x86 CPU (up to 1.5GHz frequency) with CX 700 Companion chipset allows this Mobile Computer to supply a remarkable flexibility and efficiency in computing power.

The Secondary AITP (Automotive Intensive Task Processor) CPU 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 can be always powered ON; it can turn ON and OFF the Device and all its peripherals.

## THE HIGH FLEXIBILITY OF MICROSOFT WINDOWS EMBEDDED AND VERY HIGH PERFORMANCE VIDEOGRABBER COMBINED WITH

The 4GMCU+ provides DVR functionalities (Digital Video Recorder) through the 3 Independent Channel Video Grabber able to perform MPEG4 and H264 compression in PAL/NTSC format up to 25 fps refresh rate.

The power of the three ARM CPUs for the video coding and compression with the flexibility of Windows Embedded Standard Operative System, allow to use this Device to perform any video surveillance and accident data recorder request (such as cyclic recording, recording on alarm event, remote transfer of real-time video and historical videos).

In fact the advanced Microsoft Windows Operative System and the Digitax libraries allow to develop simple and fast applications in the most popular programming languages (such as Java, qT, C/C++, C# .NET, VB .NET) capable of handling Over-IP video streams

## 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. The HSUPA modem allows very reliable and high speed communication with operating headquarters for device tracking and remote real-time video viewing/storing. The vehicle is located by the high performance GPS U-Blox 6 receiver with 50 channels, over 2 million of correlators and compatible with the new European positioning system GALILEO.

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

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

## INPUTS AND OUTPUTS

The Device supplies a wide range of communication channels with the external environment. The three RS232 / RS422 / RS485 ports and the three power outputs allow the device to manage the power and control the Pan, Tilt and Zoom (PTZ) of the cameras.

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

## SERVICE POWER KEY

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

- normal press to start from Internal Flash Disk
- long press to start from SDHC Card
- long press to Shutdown Windows OS safely

## DUAL 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
- SDHC for large data storage (large maps, images, movies, logs) and for service (system initialization or Full System 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 shutdown 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.

# 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/m<sup>2</sup>

Ambient Light Sensor with 32 Steps Automatic Regulation

## 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 M16 CPU for Automotive Intensive Tasks (AITP)

## AITP Functionality

Low consumption power management with start-up / shut-down control and car battery disconnection (only stand-by circuit is active)

Allow to keep alive the Communication interfaces and Inputs / Outputs also when the O.S. is powered down

Automatic and Programmable Fan control with Internal Temperature Sensor and PWM Driver

## Ram Memory

256MB up to 1GB RAM Memory

## Storage Memory

1GB up to 4GB capacity of Internal Flash Memory

SDHC (High Capacity) Socket up to 32GB

## Digital Video Recorder

3 Video Inputs (independent channels)

Video Grabber over IP with 3 Independent CPUs (ARM based with Linux OS)

Data Transfer by Ethernet BUS

MPEG4 and H264 compression

PAL and NTSC supported

Frame Rate up to 25fps

Management and Control by Web Interface

Obscuring of partial areas to Privacy policy available

Informations impression (timestamp, GPS position, general text, etc.) on the Header and on the video frames

## Connectivity

### Primary Modem

HSUPA / HSDPA / UMTS / EDGE / GPRS / GSM embedded module, HSUPA 5.76 Mbps uplink, HSDPA 7.2 Mbps downlink

Dual SIM, switchable through programmable selection circuit by user application (API provided)

Secondary RS232 Serial Port available (Hardware MUX) allow AT commands from user application also when RAS is connected through the Primary Port

### Secondary Modem

GPRS / GSM Class 10 module

Dual SIM, switchable through programmable selection circuit by user application (API provided)

Secondary RS232 Serial Port available (Hardware MUX) allow AT commands from user application also when RAS is connected through the Primary Port

### General Functions

Modems can be powered on when the terminal is OFF

Wake-up on ring programmable feature

Warm Reset and Cold Reset available through API calls

Support international standard protocol (ETSI AT Command set)

Support RAS (Remote Access Service) dialup function

GPS / GPRS Rugged Combo Antenna (Option)

UMTS / WiFi / GPS Rugged Trimodal Antenna (Option)

## GPS Receiver

Ublox 6 SuperSense Technology and Indoor Navigation, new generation GPS chipsets with improved precision and fast acquisition of position fix on start up and sleep mode

# 4GMCU+

50 Channels, 2 Million correlators, GALILEO Compatible

SBAS supported: WAAS, EGNOS, MSAS, GAGAN

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 5 Hz Frequency

Warm reset and cold reset available through API calls

Assisted GPS (A-GPS) available

### Communication Ports

Generic USB Host

RS232 Serial Port for Digitax M2 VGA Display communication

Three (3) Serial Ports (independent set-up as RS232, RS422 or RS485) for general purposes or cameras management

### I/O ports connection

Odometer Input

4 Digital Inputs

2 Analog Inputs

3 Power Output for general purposes or camera management

1 Power Output for VGA Display management

1 Power Output for general purposes

Dedicated Ignition (Engine) Input

Dedicated Emergency Switch (Panic Button) input, allow to notify emergency status

1 PS2 Keyboard Connector

LAN (Ethernet Port) for Debug, Development and general purposes

### Hardware Keys

6 Lighted and Software Programmable Hardware Buttons

### Power-on Key

1 Power ON/OFF Button

### Alarm and Security

Panic Button input

Stealth Mode Controller (system ON display, audio and lightings OFF)

Fully Programmable Stealth Display mode, Screen Saver mode and Sleeping mode by:

- Power Button
- Hardware Keys
- API

Enable Switching OFF LCD without powering down the Device

### Multimedia

VGA Output

Audio Output (Line level)

Microphone Input

Audio Power Output for external Speaker

### Boot

Dual Boot Manager (Internal Flash Disk and SDHC Card)

File System Integrity Check

OTA Application Update

Peripheral GPS and Modems Power Management

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 (System Restore) available by SDHC Card

### Safe Windows shutdown procedure

Pre-Shutdown Notification

Disk Activity Signal Control

On-Board UPS Backup Battery

### Operating System

Windows Embedded Standard 2009

ATL, MFC, Microsoft .NET Framework 3.5 SP1 and Digitax Framework 4.1

### Development Tools

Debug through Ethernet Port

Microsoft .NET Framework 3.5 SP1 supported with Samples Code provided

Sample Code for SDK C++ Language

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

# Technical Specifications

## Serial Port Driver and Test tools

Digital I/O Driver, API (DLL) and Test tool

Software controllable Warm Restart and test tool

Modems Drivers and Test tool

Speaker and MIC test tool, wave playback and voice recorder

Backlight control API and test tools

Support Network Protocol TCP/UDP, IP, PPP-

Virtual Keypad

## Text-To-Speech

Supports 3rd part Text-To-Speech application

## Software Navigation

Supports 3rd part Map Application and Navigation Software with SDK provided

## System Diagnostic Tools

On Field Test (OFT) On-board Diagnostic Utilities included with Customizable CheckList to make tests of GPS, Antenna connections, Modems Connectivity and Base Station Signal Quality, Odometer, Ignition (Engine), Panic Button, TouchScreen Calibration, Hardware Keys, Ambient Light Sensor, Device Version, OS Version, AITP Version, UPS and Battery Status, Navigation Software, Digital Inputs and Power Outputs

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

## OS Image Loader

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

## System Update Fleet Management

Professional Over The Air (OTA) Client allows the update of the whole Operating System and all the CPUs and Peripheral Firmwares

Professional Over The Air (OTA) Server with vehicles enrolling, group management and selective update, remote debugging and logging (Web Based user interface)

## Power Supply

8 – 32 V with Surge Protector

## Battery

On-board UPS with Internal Battery Package with up to 30 minutes of autonomy for Safe Shutdown

## Mounting

Fixed cables on the connectors with anti-rip retention and lock sealed screws

Accessible slots such as SIM Cards, SDHC, USB, etc. are sealed

Double Fitting (vertical and side)

## Operating Temperature

-20°C to 70°C

## Humidity

Humidity up to 95% non-condensing

## Vibration

Vibration Sine Wave, 10 ~ 500 ~ 10Hz, 1.5G, 0.37 oct/min 3 axis, 1 Hour/axis



# 4GMCU+



4GMCU+ Mobile Control Unit



# 4GMCU+



## WINDOWS EMBEDDED STANDARD OPERATIVE SYSTEM AND DEVELOPMENT TOOLS

Microsoft Windows Embedded Standard Operative System and Compact Framework 3.5 SP1 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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