MMI V2 5,7”

OVERVIEW

The MMI V2 unit is a programmable controller designed to perform the function of master and man/machine interface on industrial mobile vehicles. Here are the main features:

- Compact design, possibility of customization of the front panel
- High-speed communication channels (LTE, Ethernet)
- IP67 case (not limited to the front panel only, but referred to the entire box), AMP-Seal connectors

The heart of the system is a SoC with 2 ARM® Cortex®-A9 cores (2 x 800MHz) with graphics unit capable of managing 2 independent displays with 3D accelerator (OpenGL ES2.0).
The memory available is 1 GByte DDR3 RAM (400MHz, 64 bit) and 1 GByte NAND Flash (high quality SLC), expandable with two micro-SD cards up to 2 x 32 GByte.
In addition to the main processor, a second processor is also used, based on an ARM Cortex-M7 (480 MHz), with supervisory function, management and monitoring of board power supplies and management of the input/output resources. This processor can be used for the real-time part when using Linux Embedded as operating system
The operating system used is Windows Embedded Compact 7 (or Linux Embedded) which, in addition to guaranteeing real-time type control, provides programming tools similar to those native to the PC-Windows environment (Microsoft® Visual Studio, Silverlight etc.).
The MMI V2 has a large number of communication interfaces that can meet any need: USB 2.0, Ethernet, serial RS422/485 or RS232, CAN-FD / CAN-bus 2.0B.
The MMI V2 is equipped with a 3-axis accelerometer and a 3-axis gyroscope.
LTE and GPS technologies also offer a valid and economical solution for connecting machines to the outside world.

SPECIFICATIONS

- CPU master: NXP i.MX6DL (2 x Cortex-A9 @ 800Mhz), Internal memory: 144 kByte RAM (OCRAM), 32i+32d kByte L1 cache, 512 kByte L2 cache
- External memory:
  - RAM: 1 GByte DDR3, (2 / 4 GByte DDR3 optional)
  - NAND Flash: 1 Gbyte, (2 / 4 GByte optional)
  - 2 slot micro SD-card (optional additional memory up 2 x 32 GByte)
- CPU slave (supervisor): STM ST32H7x 480 MHz (Cortex-M7), Internal memory : 128 kByte Flash, 564 kByte RAM external up to 32MByte Flash (optional)
- 3-axis accelerometer
- 3 axis gyroscope
- MINI PCI-E slot for LTE modem with micro SIM-Holder
- Slot M.2
- GPS Module

OUTPUTS

- 2 high-side PWM outputs (4A max.), with self-diagnosis and short-circuit protection
- 2 programmable current generators (0..20mA) for direct interfacing with resistive sensors (PT100, PTC, NTC, etc.)
- 5 Vdc output (1A max.) for powering external sensors
- HDMI Output **(optional)**

INPUTS

- 2 composite video inputs (PAL/NTSC/SECAM) for managing as many cameras (it is possible to view one camera at a time)
- 6 programmable analog inputs (0..5V, 0..25mA, 0..500mV and 0..2.5mA) with 16-bit resolution.
- 8 ON/OFF digital inputs configurable via software as high-side or low-side, all usable as frequency inputs (up to 2KHz)
- Keyboard up to 25 keys (5x5 matrix)

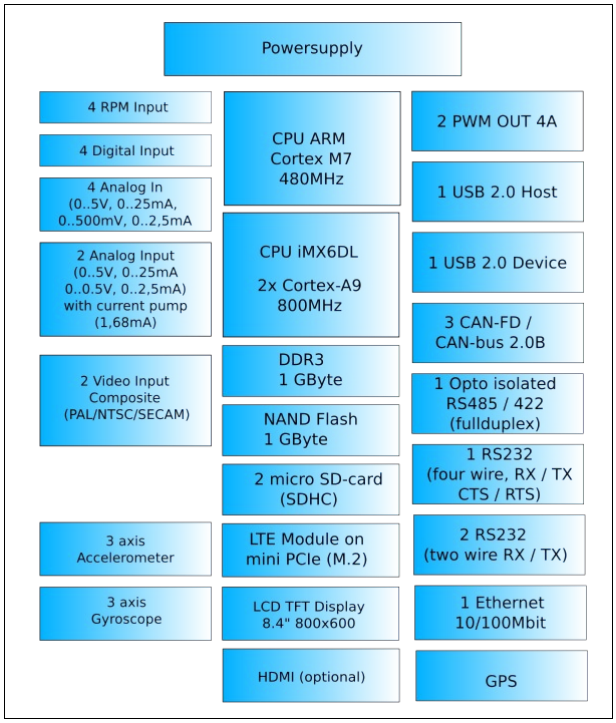
CONNECTIVITY

- 1 RS422/RS485 (configurable) serial interface with galvanic isolation
- 3 RS232 serial interfaces (1x RX/TX and RTS/CRS, 2x only RX/TX)
- 1 USB Host 2.0 port
- 1 USB Device 2.0 port
- 1 Ethernet 10/100 Mbit
- 3 CAN-FD/CAN-bus full 2.0B, programmable baud-rate from 125Kbit/s to 1Mbit/s, CANOpen and J1939 protocols (optional: ISOBUS)

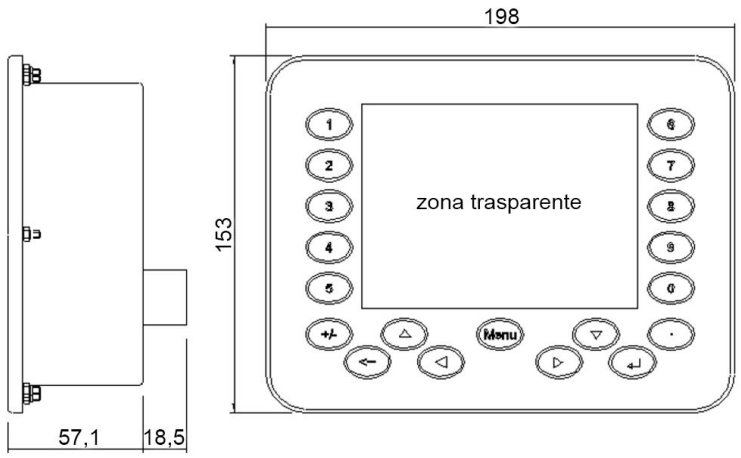
OPERATING CONDITION

- Supply voltage: 9 .. 32 Vdc
- Operating temperature range: -30 .. +70 °C
- Storage temperature range: -40 .. +85 °C
- Max. humidity level: 95% (without condensation)
- Protection grade: IP67 (with connector plugged)
- Weight: 1300 g

BLOCK DIAGRAM



MECCANICAL DIMENSION



STANDARDS AND REFERENCE DOCUMENTATION

- Direttiva 2014/53/UE (Direttiva Apparecchiature Radio – RED)
  - Art. 3.1.a) Sicurezza
    - EN 61010-1:2010 +A1:2019 +AC:2019-04 - Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
    - EN 61010-2-201:2013 + AC:2013 - Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-201: Particular requirements for control equipment
    - EN IEC 62311: 2020 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz)
  - Art. 3.1.b) Compatibilità Elettromagnetica
    - EN ISO 14982 1: 2009 +A1: 2010 - Agricultural and forestry machinery - Electromagnetic compatibility – Test methods and acceptance criteria (ISO 14982:1998)
    - ISO 13766-1: 2018 +A1: 2010 - Earth-moving and building construction machinery – Electromagnetic compatibility (EMC) of machines with internal electrical power supply - Part 2: Additional EMC requirements for functional safety (ISO 13766-2:2018)
    - EN 12895-2015+A1-2019 - Industrial trucks - Electromagnetic compatibility
    - ETSI EN 301 489 V2.2.3 - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
    - ETSI EN 301 489-52 V1.2.1 - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication Mobile and portable (UE) radio and ancillary equipment; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
  - Art. 3.2 (Uso efficace dell spettro radioelettrico)
    - ETSI EN 301 908-13 V.13.1.1 - IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)
- UN ECE Regulation No. 10 Revision 6 - Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility