IDEA



PRODUCT VERSION

This technical data sheet is related to following product versions of dashboard Idea:

	DASHBOARD IDEA OTS1		DASHBOARD IDEA FULL	
PN#	6100610/0x		6200611/0x	
Power supply	12 Vdc	24 Vdc	12 Vdc	24 Vdc
Contents				
Inputs / outputs	X	X	X	X
CAN BUS 1, 2	X	X	X	X
LIN BUS	X	X	X	X
RTC	X	X	X	X
Sensor supply	X	X	X	X
18 LED telltales	X	X	X	X
4 push buttons	X	X	X	X
Light sensor	X	X	X	X
Analog video input	X	X	X	X
Additional contents				
Eth-BR			X	X
BLE			X	X
Touch screen			X	X
Certifications				
Type approval ECE ONU reg10-05 E3[2]	X	X	X	X
MTA Studio ID[1]	0200	0300	0000	0100

GENERAL DESCRIPTION

Idea is a dashboard designed for agricultural or off-highway vehicles, on wheels or tracks.
Power supply is 12 and 24 Vdc.

Dashboard Idea common features:

- 1 color 7" TFT form factor 16:9, FFS technology, brightness min 1000 cd/m^2;
- 18 telltales;
- 1 light sensor;
- 10 digital inputs;
- 6 analog inputs;
- 2 frequency inputs;
- 1 D+ (alternator);
- 3 communication lines (2 CAN, 1 LIN);
- 1 power supply for external sensors;
- 5 outputs (1 low side driver, 4 high side drivers);
- 4 push buttons;
- 1 analog video input (PAL / NTSC).

Idea Full (PN# 6200611/0x) includes the following options, not mounted on the Idea OTS1:

- BLE;
- BroadR-Reach Ethernet;
- touch screen.

Idea can be used as a dashboard with the following features:

- hour meter, odometer, gear, speed, engine RPM, trip data, etc.;
- PTO symbols, PTO RPM, clock, temperature, voltmeter;
- errors (FMI - SPN), service, etc.;
- analog signal interface and monitor;
- digital signal from external sensors.

An RTC module is available to give timing information, without backup battery.

It features a memory for permanent data storage (EEPROM).

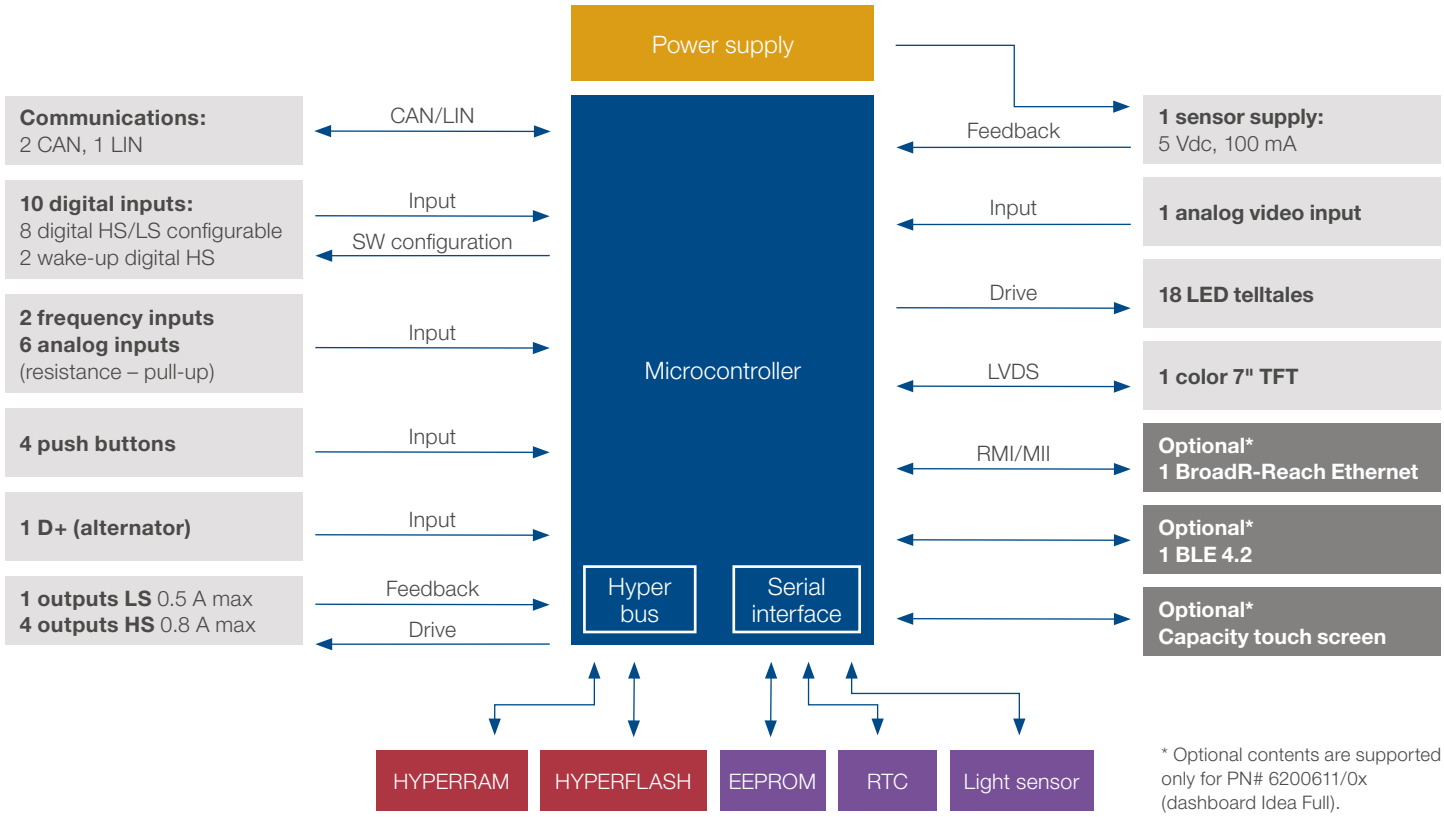
Idea is configurable with MTA Studio and MTA Gate[3].

MTA Studio is a specific tool used to program dashboards, displays and electronic control units which have been developed with customizable functions allowing the customers to create “tailored” devices.

MTA Gate is a specific tool designed for EOL department and/or for technical service points use.

1. The “MTA Studio ID” here listed are referred to the MTA Studio variants, for dashboard Idea product family, written on the product label. Please contact MTA for any info about it.
2. Extension of ECE ONU reg. 10-05 will be done after the product qualification.
3. Please contact MTA to verify which features can be programmed with MTA Studio and MTA Gate. Custom development could be evaluated by MTA in case of specific functionalities needed and not already available.

BLOCK DIAGRAM



* Optional contents are supported only for PN# 6200611/0x (dashboard Idea Full).

SPECIFICATIONS

CHARACTERISTICS	DESCRIPTION	QTY
Operating voltage		
Nominal	12 and 24 Vdc	
Supply voltage, permissible range	9÷32 Vdc	
Operating temperature		
External ambient temperature	-20 to +70 °C	
Storage temperature		
External ambient temperature	-40 to +85 °C	
Protection rate		
IP66		
Weight		
270 gr		
Mounting location (ref. TS 50/16)		
Cab interior C1		
Telltales		**18**
High efficiency LED monochrome	Light intensity driven by PWM	
Diagnosis	ADC diagnosis	2
	LED driver diagnosis	10
	ADC and LED driver diagnosis	6
Display		1
TFT 7" FFS technology, form factor 16:9	Color, 152.4 x 91.44 pixels, 16.7 M colors	1
Transparent touch panel (optional)	Type projective capacitive touch panel	

Microcontroller	
ARM Cortex R5F	S6J32GELSNSC2000 55-nm Traveo (MCU S6J3200 family, 32 bit)
Clock frequency	
MHz	240 (PLL0)
Internal memory capacity in microcontroller	
Flash	4160 KB
RAM	128 KB TCRAM + 128 KB SDRAM
Memories	
EEPROM	32 Kbit (4 KB)
HyperFlash	512 Mbit (64 MB)
HyperRAM	128 Mbit (16 MB)
Real time clock	
Non battery powered	Clock time deviation: ±2.17 sec per day (temperature range: -40 to +95 °C)
Ambient light sensor	
Ambient light sensor for manual night and day view managing	✓
PCB temperature sensor	
Internal	NTC sensor, accuracy: ±5%
Battery voltage measurement	
Internal	Accuracy: ±5% of full scale value
Backlight	
LCD	White with dimming function

CHARACTERISTICS	DESCRIPTION	QTY
Interfaces		**5**
CAN bus (up to 1 Mb/s)	ISO 11898 One of these with wake-up function and CAN FD optional with dedicated software release	2
LIN bus	LIN 2.1 Master	1
BroadR-Reach Ethernet (optional)	Up to 100 Mb/s, with wake-up capability, with a dedicated connector	1
BLE (optional)	V5.0 hardware supported	1
CAN bus termination resistor		
Termination resistor	CAN1: activated/ deactivated by MTA Studio CAN2: not provided	
Constant voltage source (Vref)		**1**
400 mA	5 Vdc ± 5% (FS)	1
Analog inputs		**6**
Resistance mode	12 bit	6
Digital inputs		**10**
Programmable polarity via software	Voltage range: 0-VBat Vdc	8
Active high (switch to battery)	With wake-up capability	2
Frequency inputs		**2**
Alternator (W) inputs	Up to 5 kHz	2
Alternator input (D+)		**1**
Digital input read as analog 9-32 Vdc	12 bit	1
Internal load	40 Ω	
Minimal excitation current	225 mA	
Low side outputs		**1**
Digital output with analog diagnostic	Max. 500 mA	1
High side outputs		**4**
Digital output with current sense	Max. 800 mA	4

Fault detection in the event of cable break and short circuit		
All connector signals (inputs, outputs, CAN lines) are protected against permanent short circuit to ground and VBat	Maximum short-circuit voltage: 18 Vdc for 12 Vdc system and 32 Vdc for the 24 Vdc system NOTE: for the short circuit protection it's necessary to apply one MiniVal fuse on the battery pin and one on the key pin	
Reverse polarity protection		
Power supply	✓ Maximum polarity inversion voltage for the 12 Vdc system is -14 Vdc, for the 24 Vdc system is -28 Vdc ✓ NOTE: for the short circuit protection it's necessary to apply one MiniVal fuse on the battery pin and one on the key pin	
Inputs		
Outputs		
Wake-up		
From key, digital input pin 24, 25, CAN0, Ethernet (optional)	As long as there is traffic on the CAN 0 and/or Ethernet lines, the MCU can keep the cluster in wake mode	
Push buttons		**4**
Configurable functions in MTA Studio	Rubber, not illuminated	4
Analog video input		**1**
PAL/NTSC/SECAM with auto-detect	With a dedicated connector	
Materials and others mechanical characteristics		
Front mask	PC+ABS Bayblend T65 XF black	1
Back cover	PC+ABS Bayblend T65 XF black	1
Lower and upper keypad:	Black silicon rubber 70 shA	2
Chassis Gore-Tex valve for environment air exchange		1
Protective glass features		
Cover glass + TFT	Optically bonded	
Cover glass	Anti-glare, anti-reflection, anti-fingerprint, anti-scratch	

CHARACTERISTICS

DIGITAL AND ANALOG INPUTS

Characteristics

- Digital high side/low side inputs software configurable (pins 4, 5, 6, 13, 14, 15, 22, 23):
  - 0-VBat voltage range;
  - the contact resistance must be ≤ 10 Ω (in the operating range 9-32 Vdc);
  - switch detection threshold for digital inputs active high (switch to battery):
    active input: (VHmin) = 4.8 Vdc, IINtyp = 2 mA;
    open input: (VLmax) = 3.2 Vdc;
  - switch detection threshold for digital inputs active low (switch to ground):
    active input: (VLmax) = 3.2 Vdc, IINtyp = 2 mA;
    open input: (VHmin) = 4.8 Vdc.
- Digital active high inputs (pin 24, 25):
  - 0 - VBat voltage range;
  - the contact resistance must be ≤ 10 Ω (in the operating range 9-32 Vdc):
  - with wakeup capability;
  - switch detection threshold:
    active input: (VHmin) = 4.7 Vdc;
    open input: (VLmax) = 3.3 Vdc, IINtyp = 2 mA.
- Analog input (pins 19, 20, 21, 27, 28, 29):
  - pin 19: pull-up to Vref 180 KΩ resistor; accuracy: ±10% of the read value in the range 100÷1 KΩ;
  - pin 20: pull-up to Vref 180 KΩ resistor; accuracy: ±10% of the read value in the range 100÷1 KΩ;
  - pin 21: pull-up to Vref 2.7 KΩ resistor; accuracy: ±20% of the read value in the range 100÷10 KΩ;
  - pin 27: pull-up to Vref 330 Ω resistor; accuracy: ±20% of the read value in the range 100÷1 KΩ;
  - pin 28: pull-up to Vref 33 KΩ resistor; accuracy: ±20% of the read value in the range 1 K÷100 KΩ;
  - pin 29: pull-up to Vref 1 KΩ resistor; accuracy: ±20% of the read value in the range 100÷3.3 KΩ.

Wake-up functionality

The digital inputs pin 24, 25 can be programmed with wake-up capability through MTA Studio.

Wetting current activation

All digital inputs provide cleaning contact function always active by a wetting current value equal to 2.0 mA @ 12 Vdc.

FREQUENCY INPUT

The signal applicable into the input (pin 11, 12) can be defined in the following modes:

- alternator (W) type signal (square wave);
- maximum expected frequency: 5 KHz (min 5 Hz), duty cycle typ. 50% (min 30%, max 70%);
- voltage range of the input signal: 0-VBAT (VH: 3÷32 Vdc; VL: 0÷1 Vdc);
- frequency measurement accuracy: ±10% of read value.

OUTPUTS

High side output

4 high side outputs 800 mA (pin 31, 32, 33, 34):

- iLoad: 0.1÷6 A;
- Vclamp: 58 Vdc;
- Ron: 0.2 Ω;
- power supply from battery input;
- current monitoring by analog current sense (accuracy: max ±12% of read value in 0.8-6.0 A range);
- all drivers are integrated in only one HSD with current sensing diagnostic, current limitation, overvoltage protection and thermal shutdown.

Low side output

1 low side output 500 mA (pin 30):

- iLoad: 2÷500 mA;
- minimum load resistance: min 24 Ω @ 12 Vdc (32 Ω @ 16 Vdc); min 48 Ω @ 24 Vdc (64 Ω @ 32 Vdc);
- diagnostic: analog measurement of the voltage level of the connector signal, accuracy ±5% of full scale in the range 0÷32 Vdc;
- current limitation @ 1 A;
- short circuit protection up to 36 Vdc;
- in case of overvoltage and undervoltage the LSD disables the output until the next off/on key cycle.

AUXILIARY SUPPLIES

One auxiliary supply for external sensors (Vref – pin 26) is provided at 5 Vdc (accuracy: ±4%), with 400 mA maximum current.
It's also available a sensor ground on pin 18 of main connector.

LOAD DUMP PROTECTION

For the 12 Vdc system load dump not suppressed, internal resistance 2 Ω TBD generator.
For the 24 Vdc system load dump not suppressed, internal resistance 6 Ω TBD generator.
Any other type of load dump protection, different from tests specified above, has to be evaluated by MTA.

TELLTALES

All 18 telltales are driven by the microprocessor, except L7 and L13 which can also be driven directly by 2 digital inputs.
Each telltale is made by high efficiency monochrome (white) LED, PWM controlled to achieve light intensity compensation.
All LEDs except L7 and L13 telltales, have a fault diagnosis made by the LED driver that can diagnose open and short load and over temperature.
On the L7 and L13 telltales there is a diagnosis via ADC converter able to detect open and short load.
On the telltales from L1 to L6 both diagnoses are available.

CONNECTORS

Video input connector

59S14M-40MT5-E (CN7), straight plug PCB according to ISO 20860-1, (DIN 72594-1).



The video input cable must be properly designed and produced to guarantee the video signal integrity and quality. MTA suggests to use a cable type "LEONI Dacar® 360" (nominal cross-section 0.089 mm²; impedance 75 Ω) or similar for automotive applications.

Ethernet BroadR-Reach connector

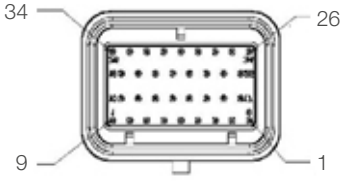
D4S14M-40MA5-A (CN9), straight plug PCB according to RN_063-01.



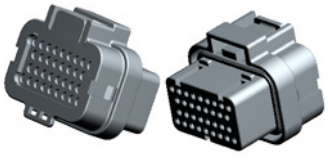
Mating connector

Tyco 34 pin connector 3 keys, PN# 4-1437290-0.





Mating connector cluster side



Mating connector cable side

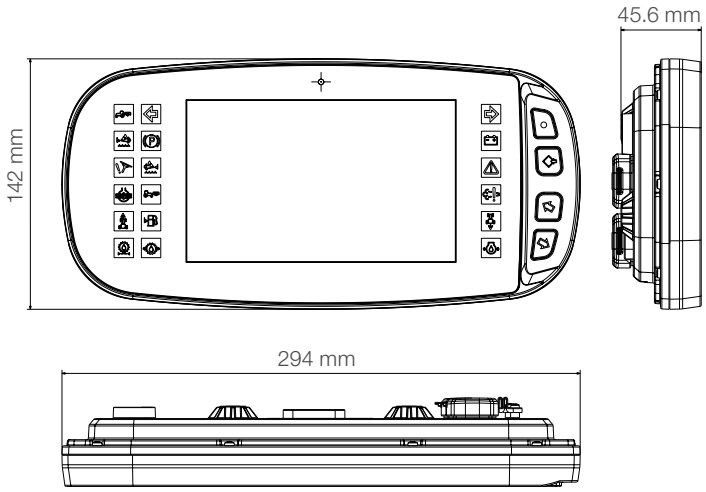
PINOUTS

PIN	NAME	TYPE
1	VB (terminal 30)	Battery power supply
2	GND (terminal 31)	Battery ground
3	D+ alternator	Alternator input
4	IN_1	Digital input low side/high side*
5	IN_2	Digital input low side/high side*
6	IN_3	Digital input low side/high side*
7	LIN	LIN bus
8	CAN2_L	CAN2 bus low
9	CAN2_H	CAN2 bus high
10	VCTRL (terminal 15)	Ignition input
11	IN_17	Frequency input
12	IN_18	Frequency input
13	IN_4	Digital input low side/high side*
14	IN_5	Digital input low side/high side*
15	IN_6	Digital input low side/high side*
16	CAN1_L	CAN1 bus low
17	CAN1_H	CAN1 bus high
18	GND	Sensor supply ground
19	IN_11	Analog input voltage
20	IN_12	Analog input voltage
21	IN_13	Analog input voltage
22	IN_7	Digital input low side/high side*
23	IN_8	Digital input low side/high side*
24	IN_9	Digital input high side
25	IN_10	Digital input high side
26	VSS	+5 Vdc AUX power supply
27	IN_14	Analog input voltage
28	IN_15	Analog input voltage
29	IN_16	Analog input voltage
30	OUT_1	Low side output 0.5 A max.
31	OUT_2	High side output 0.8 A max.
32	OUT_3	High side output 0.8 A max.
33	OUT_4	High side output 0.8 A max.
34	OUT_5	High side output 0.8 A max.

NOTE: pins marked with * can be configurable via software.

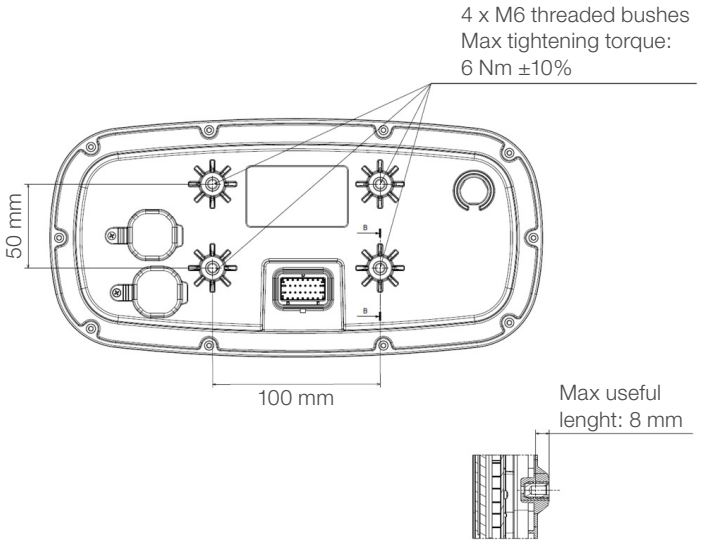
DIMENSIONS

All the PN#s of dashboard Idea share the same mechanical parts.
The external dimensions are: 294 x 142 x 45.6 mm, they are common to all the product variants of the Idea family.
Plastic: PC+ABS Bayblend T65 XF RAL 9005.



FIXING

Fixing is made by 4 screw fixing points (VESA), standard: 50 x 100 mm.
WARNING: depending on the installation conditions, the vehicle producer has to verify whether anti-vibrant mounts are needed to fix Idea dashboard.
It's also important to respect the prescriptions in the picture below.



LCD

Optical bonded TFT and cover lens in mineral glass.

Features:

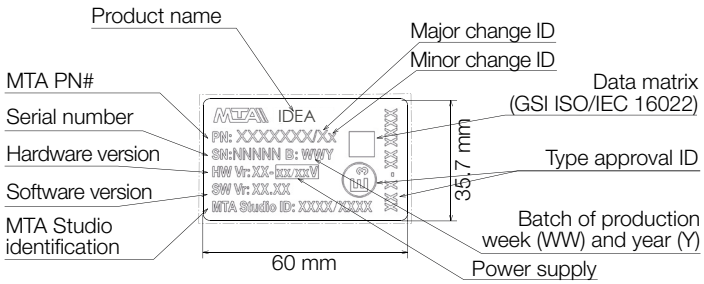
- size: 7";
- form factor: 16:9;
- active area:
  152.4 (w) x 91.44(h) mm;
- resolution: 800 x 480 pixel;
- up to 16.7M colors;
- contrast ratio: min 800:1
  (perpendicular condition);
- brightness min 1000 cd/m^2
  (perpendicular condition);
- viewing angles 80/80/80/80;
- FFS technology, transmissive type, negative mode;
- anti-glare, anti-reflection, anti-fingerprint and anti-scratch;
- storage temperature: -40 to +95 °C;
- operating temperature: -40 to +85 °C.



A software derating strategy has been implemented to preserve the display from overheating; contact MTA for details.

Standard polarizer for landscape orientation. Available on demand for portrait orientation.

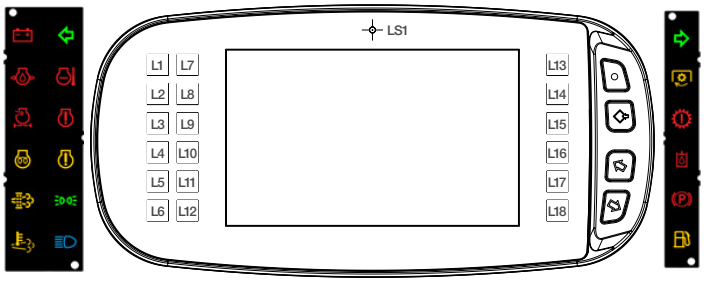
LABEL DETAILS



DIAL PLATE AND TELLTALES

NOTE:

- The dial plates here described are for reference purpose and available for the PN# of this document. Please refer to customer drawings for PN#s derived by this one (MTA off-the-shelf dashboard), in which a custom dial plate could be included.
- LS1 is the light sensor.



PRODUCT QUALIFICATION

MTA reference test specification for dashboard Idea is “TS50_16” (rev.6) which includes:

- environmental tests;
- mechanical tests;
- chemical tests;
- electrical tests;
- EMC tests;
- CE type approval.

Please contact MTA for any detail.

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