DragonTech
VISION • INNOVATION • CREATION

INSTALLATION MANUAL

DG-HMI10-00

Rugged, compact and connected 5.7" touch PC for mobile applications

Trademarks

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Revision history

Revision	Description	Date
1.0	First release	30 September 2011
1.1	Minor updates	16 December 2011
1.2	Updated the “Cable Kit” section Updated the “System installation and use” section	22 March 2012
1.3	Modem frequency bands updated	12 March 2014
1.4	Minor updates, A3 antenna description text	14 March 2014

Table of contents

Important user information

Carefully read and understand the instructions in this manual before using this device.
Whenever you have any doubt regarding the operation of this device, consult this manual or contact your local Technical Support Team.
Keep this manual for future reference.

In order to lower the risk of personal injury, electric shock, fire or damage to equipment, observe the following precautions, as well as using good technical judgment, whenever installing or using the device.

Dragontech has made every effort to ensure accuracy of this document; however, Dragontech assumes no liability resulting from any error/omission in this document, or from the use of the information contained herein.
Dragontech reserves the right to revise this document or to make changes to its content at any time without obligation to notify any person of such revision or changes.

Alerts that can be found throughout this manual

SYMBOL	MEANING
	**DANGER!** Information highlighting potential electrical shock hazards: • Personal injury or death could occur. • Damage to the system, connected peripheral devices, or software could occur. Always use appropriate safety precautions. Also ensure that the installation meets all the requirements as set out for the environment that the equipment will be deployed in.
	**WARNING!** Information highlighting potential hazards: • Personal injury or death could occur. • Damage to the system, connected peripheral devices, or software could occur. Always use appropriate safety precautions. Also ensure that the installation meets all the requirements as set out for the environment that the equipment will be deployed in.
	**NOTE** These will highlight important features or instructions.

Safety notices and warnings

Observe the following safety precautions during all phases of operation, service, and repair of the device. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the device.

Dragontech assumes no liability for the customer's failure to comply with these requirements.

The safety precautions listed below represent warnings of certain dangers of which Dragontech is aware. You, as the user of the device, should follow these warnings and all other safety precautions necessary for the safe operation of the device in your operating environment.

Do not operate in an explosive atmosphere

WARNING!
Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

Antistatic precautions

WARNING!
To avoid ESD (Electro Static Discharge) damage, always use appropriate antistatic precautions when handing any electronic equipment.

Connection to power supply or other devices

DANGER!
Before applying power to the system, thoroughly review all installation, operation, and safety instructions.
Failure to install the system power supply correctly or to follow all operating instructions correctly may create an electrical shock hazard, which can result in personal injury or loss of life, and/or damage to equipment or other property

- To avoid injuries, always disconnect power and discharge circuits before touching them.
- Only start the device with a power supply that meets the requirements stated on the voltage label. In case of uncertainties about the required power supply, please contact the Dragontech Technical Support Team or the electricity authority
- Before connecting other equipment carefully read any supplied instructions
- Always disconnect the power before connecting or disconnecting cables
- Do not perform connections with wet hands
- Check any power cords for damage before use
- Use certified power cables. The power cable must meet the requirements (voltage and current) of the device.
- Position cables with care. Avoid positioning cables in places where they may be trampled on or compressed by objects placed on them. Take particular care of the plug, power-point and outlet of power cable
- Avoid overcharging any power outlets
- Only apply power to the device or connected equipment after checking that all the above conditions have been met

Installation

WARNING!

- **Verify that the mounting location can withstand the added loads caused by the addition of the device, it should be firmly secured so that it will not cause any potentially hazardous situations (e.g. falling down due to vibration or shock)**
- **Do not operate the device near heat sources or flames.**

NOTE:
If the device must be moved from one place to another with different ambient temperatures, ensure sufficient time for the temperature of the device to stabilize before repowering.

Ventilation

WARNING!
Ensure adequate ventilation to avoid overheating, suggests the following steps:

- **When installing the device within a cabinet, rack or other enclosed space, be sure to leave sufficient space to allow adequate air circulation**
- **Do not block any ventilation openings**

Maintenance

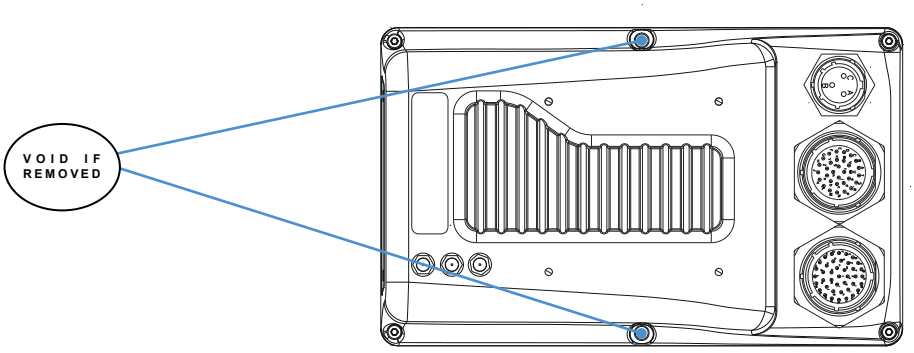
DANGER!

- **Never open, dismantle or repair the device!**
- **For your maintenance or repair requirement please contact a qualified engineer.**

If the device does not function correctly and you are unable to find a solution, feel free to contact the Technical Support Team.

If the equipment does not work properly, especially if smells unusual, unplug it immediately and contact Technical Support.

WARNING!
Do not remove the "Void if Removed" stickers located on the rear side of the product.
Removing the stickers will void the warranty.



Cleaning

WARNING!
When cleaning the device, remember to:

- **Ensure sufficient ESD protection during the cleaning process.**
- **Remove any power from the device.**
- **When cleaning an enclosed system or peripheral use a dry cloth on the external casing.**
- **With single boards, use only a low power air brush or soft bristled paintbrush.**
- **Do not use detergents, aerosol sprays, solvents or abrasive sponges.**

Life support policy

WARNING!
Users must not use products as critical components of life support devices or systems without the express written approval of Dragontech Systems LTD.

Warranty

Please contact your local Dragontech Sales Office for detailed warranty terms and conditions.

Refer to the back covers of this manual for full contact details.

CE notice and R&TTE compliance

This product is CE marked.

The CE mark on the product indicates that the system has been tested and complies with EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.

Dragontech is not responsible for the use of its products together with equipment (e.g. power supplies, personal computers, etc...) that are not CE marked and compliant with technical requirements specified in this manual.

This product also meets the essential requirements and other relevant provisions of Directive 1999/5/EC.

This product is designed to work in the following Member States and other countries using the R&TTE Directive: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Laws may change over time. Check with local authorities for changes / updates.

WARNING!
if you are not sure of your national regulations, please see:

- **http://ec.europa.eu/enterprise/sectors/rtte/index_en.htm**
- **http://www.ero.dk/rtte**

EN50155 compliance

The product is compliant to the EN50155 standard. See “Physical characteristics” on page 27.

2004/104/EC compliance

The product is compliant to the EU 2004/104/CE directive, relating to electromagnetic compatibility of vehicles.

ECE ONU Reg.10: 2008 compliance

The product is compliant to the **ECE ONU Reg.10: 2008 standard,** relating to the radio interference (electromagnetic compatibility) of vehicles.

FCC compliance

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This device contains the following:

- FCC ID: N7NMC8790 (Sierra Wireless MC8790 module)
- FCC-ID: NUK-DNXA92 (Unex DNXA-92 module)

WEEE

The information below complies with the regulations set out in the 2002/96/EC directive, subsequently superseded by 2003/108/EC. It refers electrical and electronic equipment and the waste management of such products.

When disposing of a device, including all of its components, subassemblies and materials that are an integral part of the product, you should consider the WEEE directive.

The use of the following symbol, attached to the equipment, packaging, instruction literature, or the guarantee sheet, states that the device has been marketed after August 13th 2005, and implies that you must separate all of its components when possible, and dispose of them in accordance withal waste disposal legislations:

- Because of the substances present in the equipment, improper use or disposal of the refuse can cause damage to human health and the environment.
- With reference to WEEE, it is compulsory not to dispose of the equipment with normal urban refuse; an arrangement for separate collection and disposal is essential.
- To avoid any possible legal implications contact your local waste collection body for full recycling information.

RoHS

This device, including all the components, subassemblies and the consumable materials that are an integral part of the product, have been manufactured in compliance with the European directive 2002/95/EC known as the RoHS directive (Restrictions of the use of certain Hazardous Substances). This directive targets the reduction of certain hazardous substances previously used in electrical and electronic equipment (EEE).

Technical assistance

For any technical questions, or if you cannot isolate a problem with your device, or for any enquiry about repair and returns policies, feel free to contact your local Dragontech Technical Support Team

See the back cover for full contact details.

Transportation

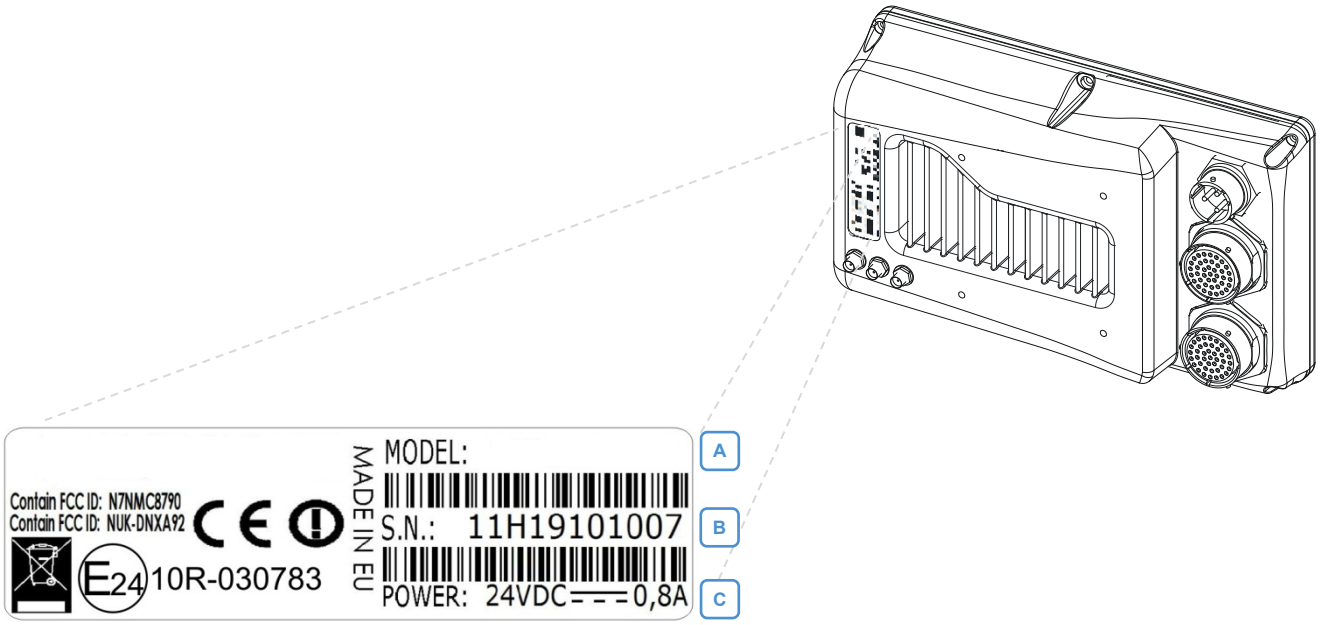
When transporting any module or system, for any reason, it should be packed using anti-static material and placed in a sturdy box with enough packing material to adequately cushion it.

Warning:
Any product returned to Dragontch that is damaged due to inappropriate packaging will not be covered by the warranty!

Device labelling

On the rear side of the device you will find a label displaying the following information:

- A Model Number
- B Serial Number (example)
- C Power Requirements



Product overview

This manual describes the main characteristics of the DG-HMI10-00, a rugged mobile display computer platform developed for Industrial, Automotive, and Rolling Stock applications.

The DG-HMI10-00 features a 262k-colour 5.7” touchscreen display and an Intel Atom 1.1 GHz processor.

It also integrates a 50-channel GPS receiver and, optionally, an 802.11 a/b/g Wi-Fi module and an HSUPA module.

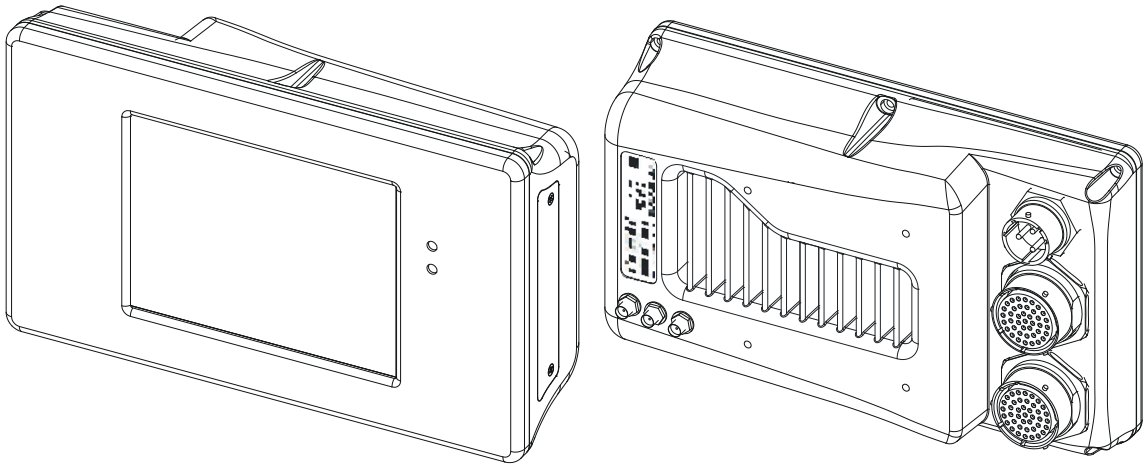


Figure 1. Front and rear views of the DG-HMI10-00 display unit

Technical specifications

Specifications	Description
Core Processor	Processor: Catalyst XL - Intel Atom Z510P, 1.1GHz, 512MB RAM System Controller Hub: Intel US15WP/PT
Mass storage	• 2 GB flash disk (soldered SSD) • 4 GB micro SD memory card

Wireless characteristics	• Localization:
	  ○ 50 channel GPS receiver; model UBlox LEA-5A
	• Communication:
	  ○ Wi-Fi 802.11n a/b/g PCI module; model UNEX DNXA-92
	  ○ HSUPA module; MC8790 (data only) UMTS (HSPA): 850/1900/2100 MHz EDGE/GPRS/GSM: 850/900/1800/1900 MHz

Display characteristics	• LCD type: 5,7” transmissive colour TFT; 4:3 VGA • Display type: Active matrix • Resolution: 640 x 480 dots • Number of colours: 262k colours • Brightness: 280 cd/m2 • Contrast ratio: 350:1 • Viewing angle: +/- 70° • Backlight: LED indicators (7 parallel x 3 serial) • Touch panel: Resistive type; Film on glass; 4-wire type; Antiglare surface

Communication interfaces	• Power IN +24VDC (+, - and earth chassis) + Key IN
	• 2x Gigabit Ethernet ports, no LED indicators
	• 1x Opto-isolated RS232 serial port
	• 1x Opto-isolated RS485 serial port, software configurable as RS422/RS232
	• 2x Maintenance USB 2.0 ports
	• 5x Isolated digital outputs
	• 10x Isolated digital inputs
	• 1x Opto-isolated odometer digital input
	• 1x CAN port (compatible with CAN specification 2.0B, ISO 11898-1)
	• Audio ports:
	  ○ 1x Stereo microphone input
	  ○ 1x Stereo headphones output
	  ○ 1x Stereo speakers output

Maintenance interfaces (accessible removing the Service Panel)	• 1x Maintenance RS232 serial port
	• 2x Maintenance USB ports:
	  ○ 1x USB for keyboard
	  ○ 1x USB for mouse.
	  (Keyboard and mouse can also be connected to the Maintenance USB 2.0 port using a USB HUB)
	• 1x VGA output (optional)
	• 1x Reset pushbutton

Hardware monitor	Temperature and voltage monitoring
Power supply	24 V DC
Cooling	Integrated passive heat-sink
Temperature	• Operating: -25°C to +55°C (70°C for 10 minutes). EN50155 Class T1 • Storage : -30°C to +80°C
Relative humidity	< 95% at 45°C non-condensing
Weight	1.5 kg (approx.)
Dimensions (L x H x P; mm)	230.0 x 140.0 x 61.7; without mounting bracket
Materials	External parts of the enclosure are made of aluminium
IP rating	IP65
Compliance	• EN 50155 (Railway applications) • EN 61373 (Vibrations & Shocks) • EN 60950 (Safety) • EN 61000 (Burst Immunity test) • EN 60068 (Temperature test) • DIN-5510-2 (German Fire and Smoke) and ISO-11170 (Italian Fire and Smoke) • Load Dump (for 24V In): ISO 7637-2 (2004-06)
Peripherals and accessories	Cable Kit

Front view

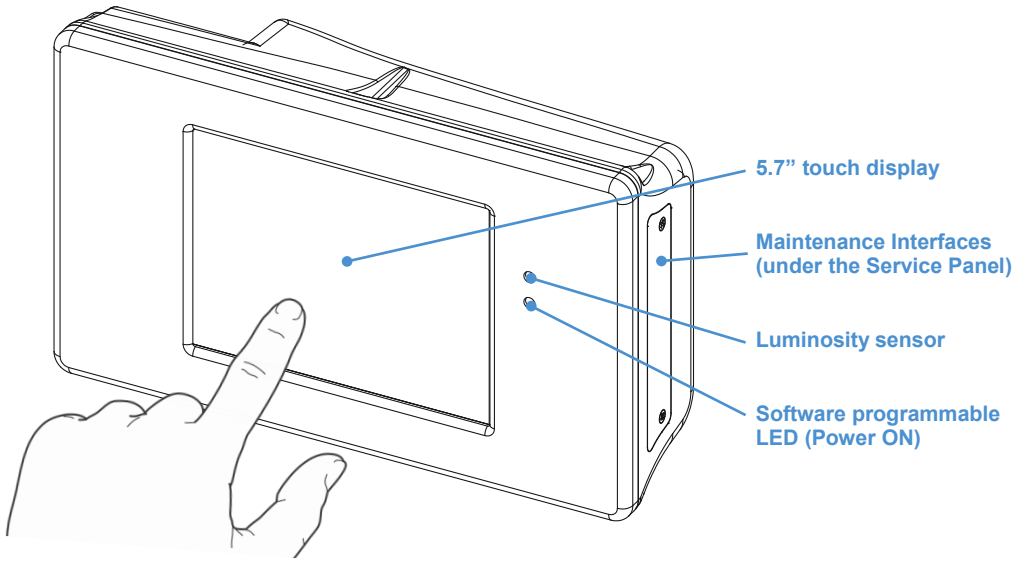


Figure 2. DG-HMI10-00: front view

Maintenance interfaces

Maintenance interfaces become available once the Service Panel is removed.

WARNING!
The IP protection of the system will be degraded by removing the Service Panel.

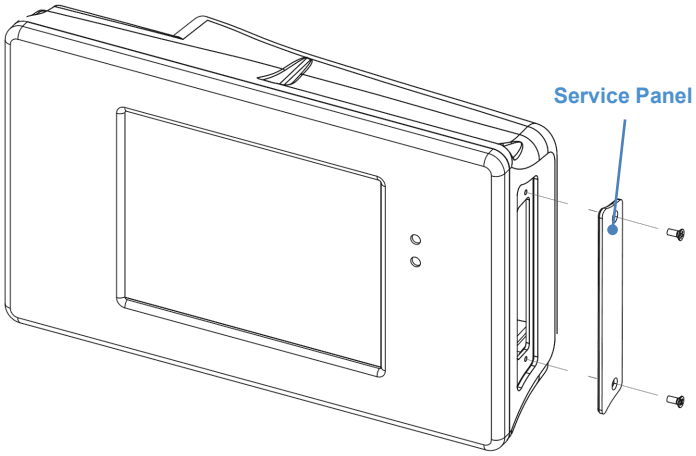


Figure 3. Removing the service panel

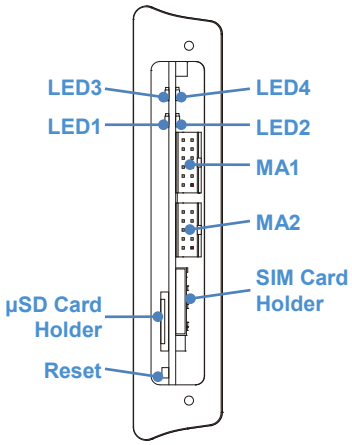
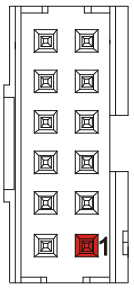


Figure 4. Maintenance interfaces

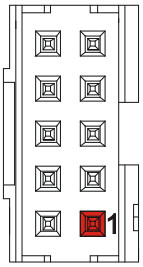
Interface	Specifications	Functionality/notes
LED1, 2, 3 and 4	Green LED indicators	**LED1:** Blinks when there is IDE activity **LED2:** Reserved **LED3:** Power good **LED4:** Power ON
MA1	**Connector:** • Type: Male Minitek; 6x2 pin, pitch 2mm • Manufacturer: FCI or equivalent • P/N: 98464-G61-12ULF **Recommended counterpart:** • Type: Female • Manufacturer: FCI o equivalent • Housing P/N: 90311-012LF • Contacts P/N: 77138-101-LF	• 2x Maintenance USB ports • 1x Maintenance RS232 serial port
MA2	**Connector:** • Type: Male Minitek; 5x2 pin, pitch 2mm • Manufacturer: FCI or equivalent • P/N: 98464-G61-10ULF **Recommended counterpart:** • Type: Female • Manufacturer: FCI o equivalent • Housing P/N: 90311-010LF • Contacts P/N: 77138-101-LF	1x VGA output
SIM card holder	Push-push card holder	The SIM card can be only inserted with the contacts facing the front of the system (the notch on the SIM card will avoid incorrect insertion).
µSD card holder	Push-push card holder	The µSD card can be only inserted with the contacts facing the rear of the system.
Reset	Push-button	When pressed it executes a hardware reset

MA1 interface: 1x Maintenance RS232 serial port and 2x Maintenance USB ports



Pin#	Signal		Pin#	Signal	
1	Maintenance USB1	+5V	2	Maintenance USB2	+5V
3		Data +	4		Data +
5		Data -	6		Data -
7		GND	8		GND
9	Maintenance Serial Port	TX	10	Maintenance Serial Port	RX
11		GND	12		NC

MA2 interface: 1x VGA output



Pin#	Signal	Pin#	Signal
1	Blue	2	Green
3	Red	4	Not connected
5	GND	6	GND
7	H-Sync	8	SCL
9	V-Sync	10	SDA

Rear view

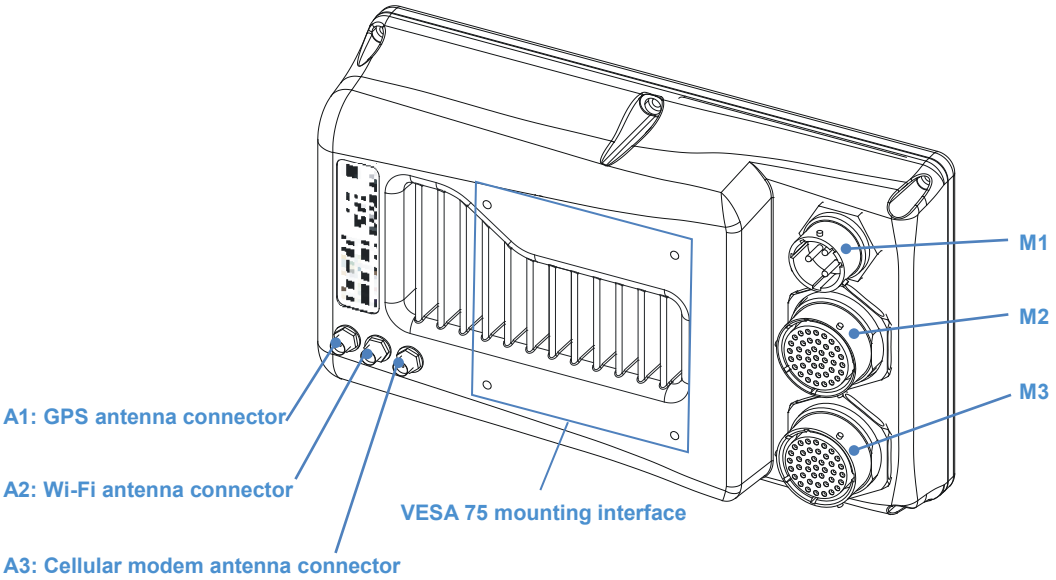


Figure 5. DG-HMI10-00: rear view

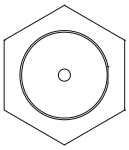
Interface	Connector	Functionality
A1, A2, A3	**Connector** Female panel mount SMA **Recommended counterpart** Male SMA connector	• A1: GPS antenna • A2: Wi-Fi antenna • A3: Cellular modem antenna
M1	**Connector** Male box-mounting MIL 26482 series: • Type: Size 12; 3-pin • PART #: Souriau 851-02E12-03P5044 **Recommended counterpart** Female MIL 26482 series: • Type: Size 12; 3-pin • PART #: Souriau 851-06RC12-03S5044	• Power Input (VIN) • Key Input (Key IN)

M2	**Connector**
	Female box-mounting MIL 26482 series:
	• Type: size 18; 32-pin
	• PART #: Souriau 851-02E18-32S5144
	
	Recommended counterpart
	Male MIL 26482 series:
	• Type: size 18; 32-pin
	• PART #: Souriau 851-06RC18-32P5044
		• 5x Optoisolated digital outputs (DOUT1 to DOUT5)
		• 10x Optoisolated digital inputs (DIN1 to DIN10)
		• 1x Optoisolated odometer digital input (ODOM+/-)
		• 1x Maintenance USB 2.0 port (USB2)
		• Audio ports:
		  ○ 1x Stereo microphone input
		  ○ 1x Stereo headphones output
		  ○ 1x Stereo speakers output

M3	**Connector** Female box-mounting MIL 26482 series: • Type: size 20; 41-pin • PART #: Souriau 851-02E20-41S5144 **Recommended counterpart** Male MIL 26482 series: • Type: size 20; 41-pin • PART #: Souriau 851-06RC20-41P5044	• 2x Gigabit Ethernet ports, no LED indicators (ETH1 and ETH2); (optionally configurable as 10/100Mbps) • 1x Maintenance USB 2.0 port (USB1) • 1x Opto-Isolated RS232 serial port (SER1) • 1x Opto-Isolated RS485 serial port (SER2); software configurable as RS422/RS232 • 1x CAN port

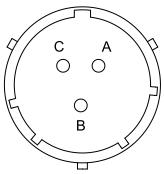
Table 1. Rear panel interfaces description

A1, A2 and A3 connectors



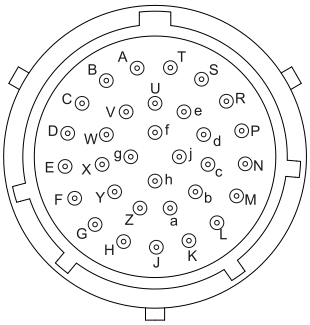
Conn#	Signal
A1	GPS antenna
A2	Wi-Fi antenna
A3	HSUPA antenna

M1 connector



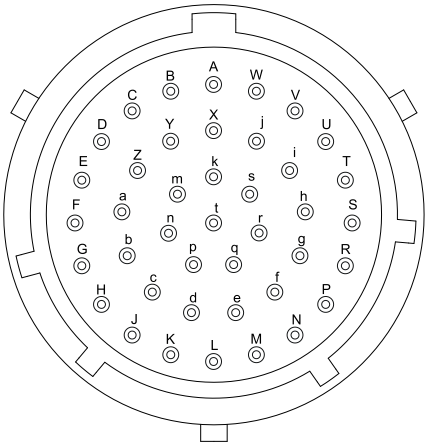
Pin#	Signal
A	VIN +
B	Key IN
C	VIN -

M2 connector



Pin#	Signal		Pin#	Signal	
A	Digital In	DIN1	T	Digital Out	DOUT5
B		DIN2	U	Microphone In	MIC_IN_L
C		DIN3	V		MIC_IN_R
D		DIN4	W	Headphone Out	HP_OUTL
E		DIN5	X		HP_OUTR
F		DIN6	Y	Speakers Out Right	ROUT+
G		DIN7	Z		ROUT-
H		DIN8	a	Speakers Out Left	LOUT+
J		DIN9	b		LOUT-
K		DIN10	c	Odometer	ODOM+
L		DIN_GND	d		ODOM-
M	Digital Out	DOUT_GND	e		GND
N		DOUT1	f	USB2	+5V
P		DOUT2	g		Data +
R		DOUT3	h		Data -
S		DOUT4	j		GND

M3 connector



Pin#	Signal		Pin#	Signal	
A	ETH1	RX2+	Y	SER1	RTS
B		RX2-	Z		CTS
C		TX2+	a		RI
D		TX2-	b		DTR
E		RX1+	c		TXD
F		RX1-	d		RXD
G		TX1+	e		DCD
H		TX1-	f	GND ISO	GND ISO
J	ETH2	RX2+	g	SER2	DSR
K		RX2-	h		RTS
L		TX2+	i		CTS
M		TX2-	j		RI
N		RX1+	k		DTR
P		RX1-	m		TXD
R		TX1+	n		RXD
S		TX1-	p		DCD
T	USB1	+5V	q	GND ISO	GND ISO
U		Data +	r	CAN BUS	Positive
V		Data -	s		Negative
W		GND	t	GND ISO	GND ISO
X	SER1	DSR	-		-

Optoisolated digital I/O features

The optoisolated digital I/Os available are:

- 10 inputs (DIN1 to DIN10)
- 1 odometer input (ODOM+ and ODOM-)
- 5 outputs (DOUT1 to DOUT5)

Optoisolated digital inputs (DIN1 to DIN10)

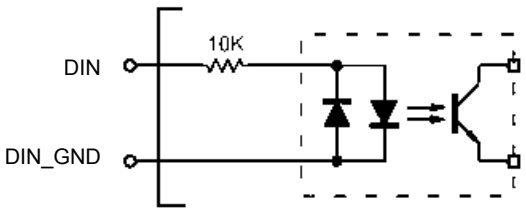
The system has 10 optically isolated digital inputs (DIN1 to DIN10). Each input corresponds to a phototransistor optically coupled to the earth reference DIN_GND, common to all digital inputs.

The response time of each input is 5 ms, thanks to an RC filter and a Schmitt trigger port, so the faster switching are filtered.

Electrical specifications:

Characteristic	Value
Logical zero threshold level	< 1.5 V
Logical one threshold level	> 10.0 V
Minimum pulse duration	10 ms
Response time	5 ms
Absorbed Current	2.4 mA

Electrical schematic:



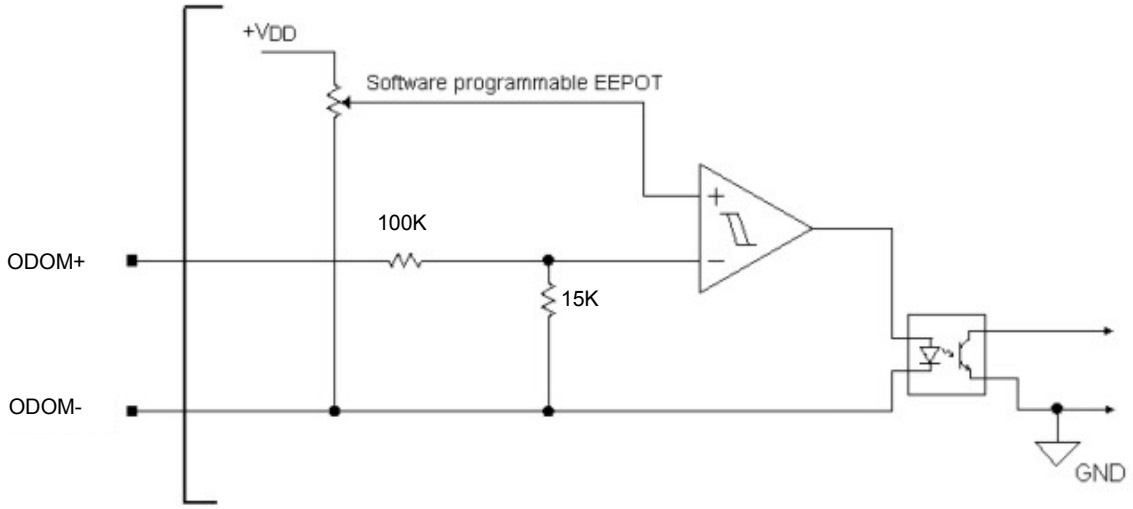
Optoisolated odometer input

The odometer input is a digital interface used to count the input pulses, and determine with these the speed of the vehicle. The input, available on pins ODOM+ and ODOM- of the M1 connector, is an optically isolated input with programmable threshold level.

Electrical specifications:

Characteristic	Value
Voltage Range	Minimum: 0 V Maximum: 32 V
Maximum Input Frequency	10 kHz

Electrical schematic:



The purpose of the programmable input threshold is to allow the user to configure the best threshold for accurate and reliable readings; the input can be seen as a trigger that counts the input pulses and deletes any spurious. The ODOM+ input is applied to a comparator whose threshold is programmable via a digital potentiometer.

Select the programmable threshold:

The purpose of the programmable threshold is to allow the system integrator to choose the best threshold value for his applications.

First, the input signal is applied to a resistor divider, with about 100 kOhm input impedance.
Then the signal is compared with a programmable reference voltage threshold:

- If the input signal is higher than the programmed high threshold, the logic input is '1'
- If the input signal is lower than the programmed low threshold, the logic input is '0'

NOTE:
The programmable reference voltage comes from a 32-step digital potentiometer (EEPOT: Electrically-Erasable Potentiometer), which wiper position is pre-set to mid-scale at every power-up.

The following table shows the available wiper settings with the corresponding threshold values (these values are measured with a 10 kHz square wave input signal having a duty cycle of 20% ~ 80%)

Wiper setting	Low threshold [V]	High threshold [V]
1	0.3	1.2
2	1.5	4.0
3	2.6	6.6
4	3.6	8.6
5	4.4	10.5
6	5.2	12.5
7	6.0	13.7
8	6.8	15.4
9	7.5	16.7
10	8.2	17.5
11	9.0	18.5
12	9.6	20.1
13	10.3	21.2
14	10.6	21.4
15	11.8	22.4
16	12.5	23.2
17	13.4	24.2
18	14.0	25.0
19	14.9	25.6
20	15.0	26.3
21	16.8	27.3
22	17.7	27.9
23	18.8	28.8
24	20.1	29.6
25	21.3	31.2
26	22.6	32.2
27	24.2	33.7
28	26.1	35.0
29	27.8	35.7
30	29.9	35.7
31	32.4	35.7
32	33.5	35.7

Optoisolated digital outputs (DOUT1 to DOUT5)

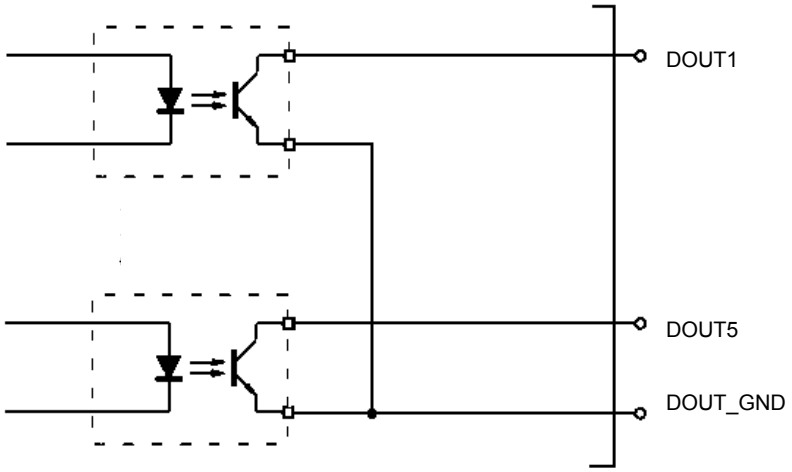
Five optoisolated digital outputs (DOUT1 to DOUT5) are available.
Outputs have a common ground connection: DOUT_GND.

NOTE:
The isolation between the digital outputs and the rest of the system is 500VAC for 1 minute.

Electrical specifications (with a pull-up resistor of 1kOhm to VIN = 30V):

Characteristic	Value
Maximum drain source voltage	36.0V
Maximum low logic level	0.4 V @ Id = 200 mA
Maximum current limit	300mA

Electrical schematic:



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System installation and use

Carefully read and understand the instructions of the chapter "Important user information" on page 5 before using the device.

To lower the risk of personal injury, electric shock, fire or damage to equipment, users must observe the following precautions, as well as using good technical judgment, whenever installing or using the device described in this manual.

WARNING!
The installation of the product described in this manual can be only performed by qualified personnel and must be carried out in accordance with the standards.

WARNING!
To avoid ESD (Electro Static Discharge) damage, always use appropriate antistatic precautions (i.e.: use an antistatic wrist strap connected to ground) when handing any electronic equipment.

Unpacking

When unpacking the equipment, ensure to remove all packaging material. All ventilation openings in the chassis must be free of obstructions. Thoroughly inspect the equipment for damage that may have occurred during shipment. If such damage has occurred, further inspection of the packaging material may be necessary.

Immediately contact your local Dragontech representative or sales office to register a claim.

Installation notes

NOTE:
The device can operate in vertical, transversal and longitudinal orientations.

WARNING!
Verify that the addition of the system does not cause instability or damage to the mounting location. Firmly secure the system.
Be aware of potentially hazardous situation when mounting the system (e.g. falling down). If required, use stiffeners to reinforce the mounting area.

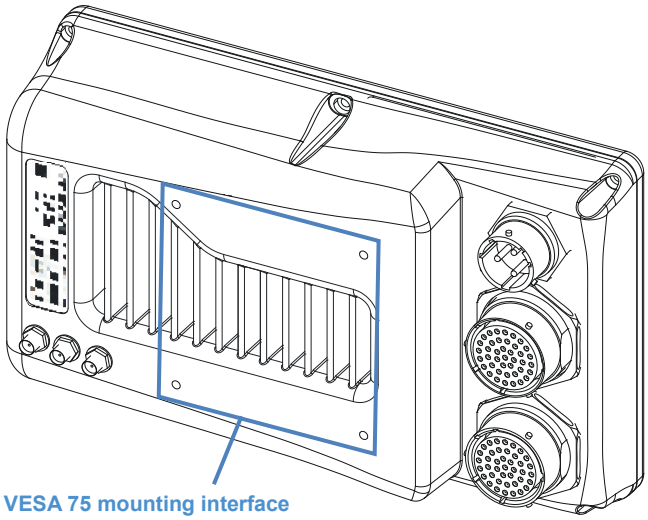
NOTE:
When the unit is mounted, ensure adequate clearance distance for cabling and air circulation: there must be sufficient space to connect the cables and for the maintenance operations.

WARNING!
Make sure the temperature and humidity will stay within the ranges specified in the paragraph "Operating characteristics" on page 27.
Be aware of other devices that may raise the ambient temperature in the installation area, also the radiated heat of the system itself.

Mounting information

To install the DG-HMI10-00 in place it is possible to use its VESA 75 mounting interface provided on the rear side. You will need to use four M4 screws (not provided). The maximum screws insertion depth is 6 mm.

NOTES:
- **To stop the screws from becoming loose we suggest using a thread locker and/or spring washers**
- **For further information about dimensions refer to "Mechanical dimensions" on page 27.**



Warnings about electrical and power connections

DANGER!

- **Before supplying power to the product, verify the correct installation, the order of operations to follow and safety instructions**
- **Power have only to be connected after the installation of the system has been completed**
- **Do not connect or disconnect the cables with the system or the external apparatus switched on**

FAILURE TO INSTALL THE SYSTEM POWER SUPPLY CORRECTLY OR TO FOLLOW ALL OPERATING INSTRUCTIONS CORRECTLY MAY CREATE AN ELECTRICAL SHOCK HAZARD WHICH CAN RESULT IN PERSONAL INJURY OR LOSS OF LIFE, AND/OR DAMAGE TO EQUIPMENT OR OTHER PROPERTY.

WARNING!
It is the responsibility of the system integrator to ensure that all connections are compliant with relevant standards for each type of interface.

WARNING!
The degree protection on the system is only obtained by covering the connectors properly. Be careful to use cables that ensure the seal of the connector. Unused connectors have to be covered with an appropriate plug. An improper cover of the connectors may result in damage to the system and other system's components due to a leaking seal.

WARNING!
See paragraph "Operating characteristics" on page 27 for the power requirements of the product.
Use only cables that are appropriate to the power rating of the system.
Make sure that during installation the system maintains a proper grounding.

How to supply the power

WARNINGS!

- **See "Important user information" on page 5 and "Warnings about electrical and power connections" on page 25 before powering the device**
- **See the paragraph "Electrical operating characteristics" on page 27 for the power requirements of the product**
- **Use only cables that are appropriate to the power rating of the system**
- **Make sure that during installation the system maintains a proper grounding**

NOTE:
When powering the system, the input voltage should be measured as close as possible to the power supply connector. This is to compensate for any cable losses, caused by cable length and other cable characteristics.

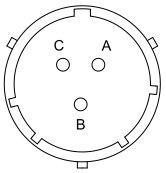
1. Set up a DC power source to meet the DG-HMI10-00 power requirements:

CHARACTERISTIC	MINIMUM	NOMINAL	MAXIMUM
Input voltage range	9.0 V DC	24.0 V DC	36.0 V DC
Input Current		0.8 A	

2. Make sure the DC power source is turned OFF

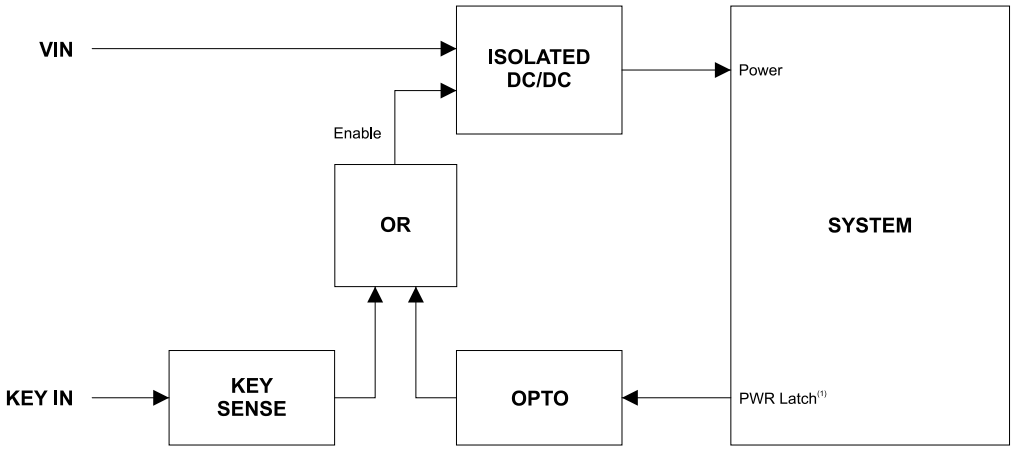
3. Realize the system power supply circuitry according to the diagram below:

THE M1 POWER SUPPLY CONNECTOR



PIN#	SIGNAL
A	VIN +
B	Key IN
C	VIN -

SYSTEM POWER SUPPLY DIAGRAM



(1) **PWR Latch:** The Power Latch control signal coming from embedded control logic

Physical characteristics

Operating characteristics

Electrical operating characteristics

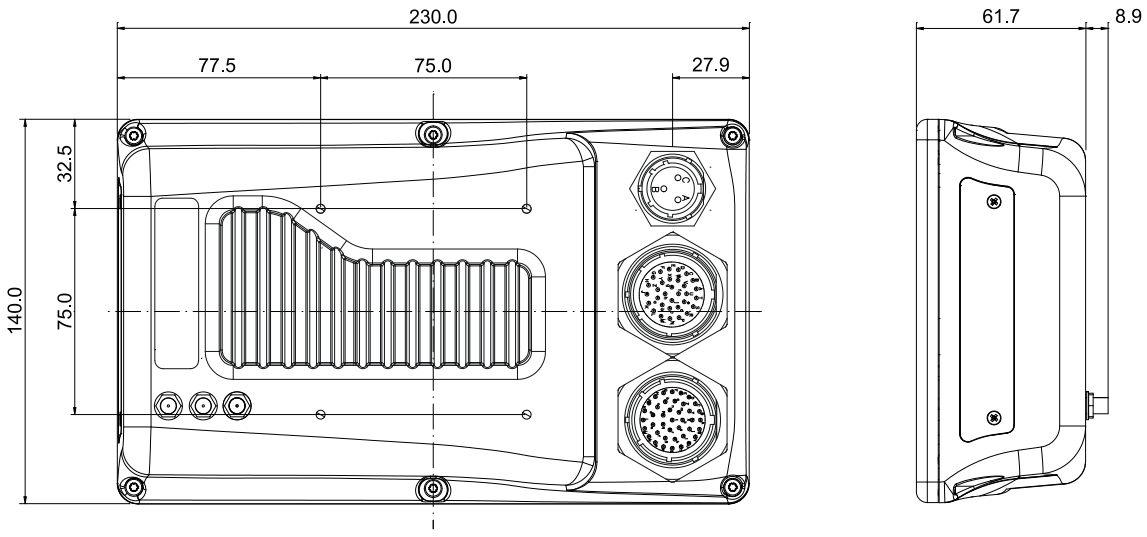
Characteristic	Minimum	Nominal	Maximum
Input voltage range	10.5 V DC	24.0 V DC	36.0 V DC
Input Current		0.8 A	

NOTE:
The internal DC/DC converter is isolated.

Environmental specifications

Characteristic	Description
Temperature	• Operating: -25°C to +55°C (70°C for 10 minutes). EN50155 Class T1 • Storage : -30°C to +80°C
Relative humidity	< 95% a 45°C non-condensing
IP rating	IP65
Compliance	• EN 50155 (Railway applications) • EN 61373 (Vibrations & Shocks) • EN 60950 (Safety) • EN 61000 (Burst Immunity test) • EN 60068 (Temperature test) • DIN-5510-2 (German Fire and Smoke) and ISO-11170 (Italian Fire and Smoke) • Load Dump (for 24V In): ISO 7637-2 (2004-06)

Mechanical dimensions



Dimensions are in millimetres.

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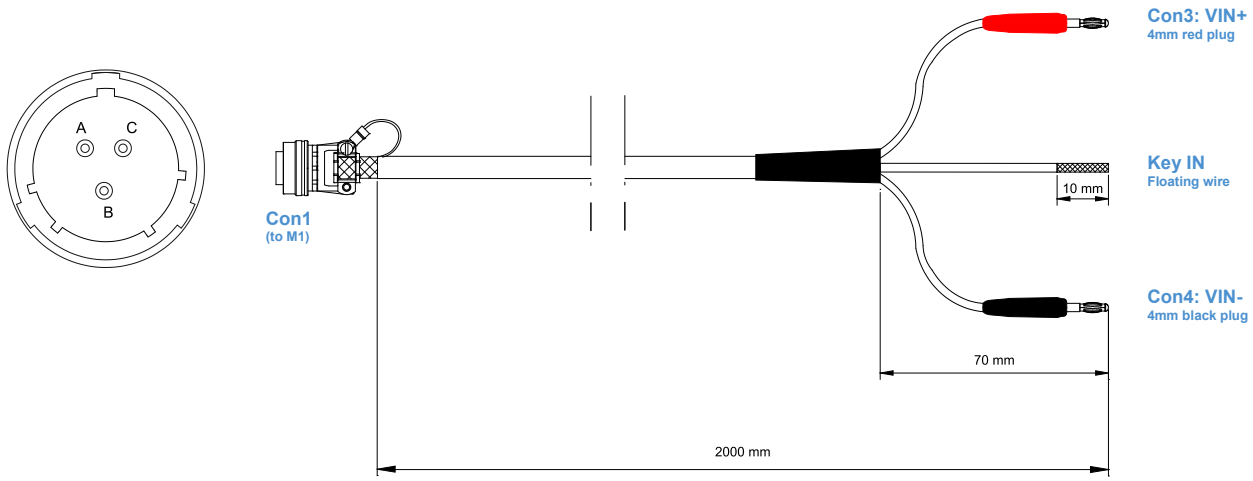
The Cable Kit (optional)

The optional Cable Kit allows you to quickly connect peripherals to the DG-HMI10-00.

Cable Kit contents:

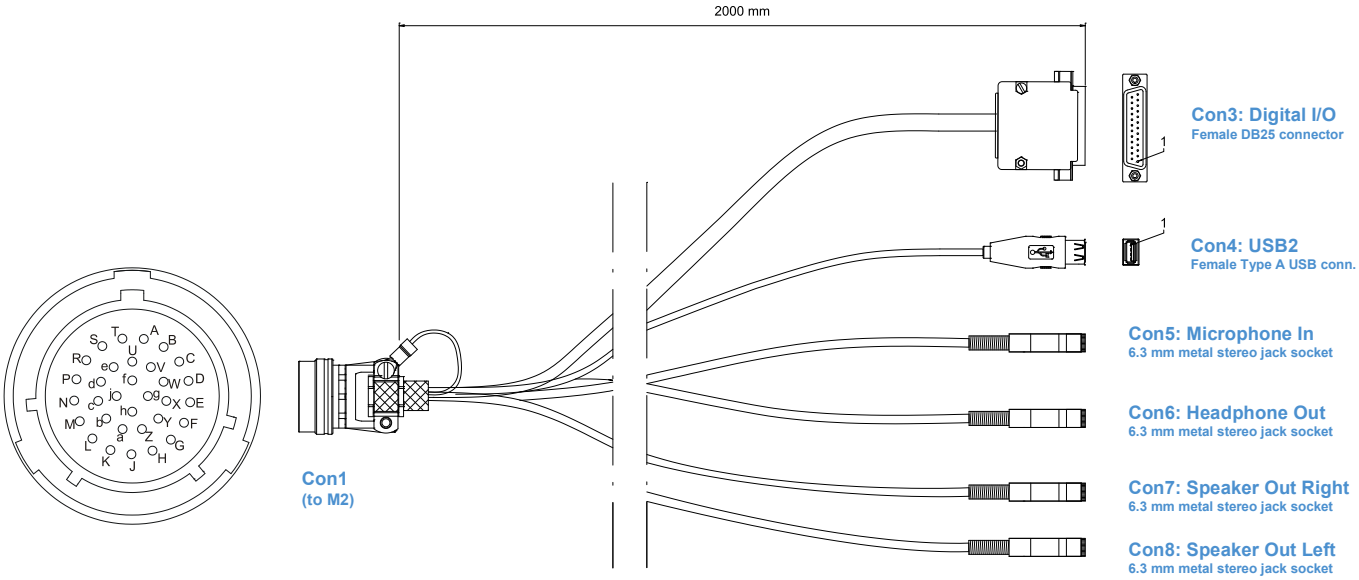
E14-12-12-00	Cable for connecting Power supply and Key IN – to M1
E14-10-10-00	Cable for connecting Digital I/O, Odometer, USB2 and Audio – to M2
E14-11-11-00	Cable for connecting Ethernet, USB1, SER1, SER2, and CAN – to M3

E14-12-12-00



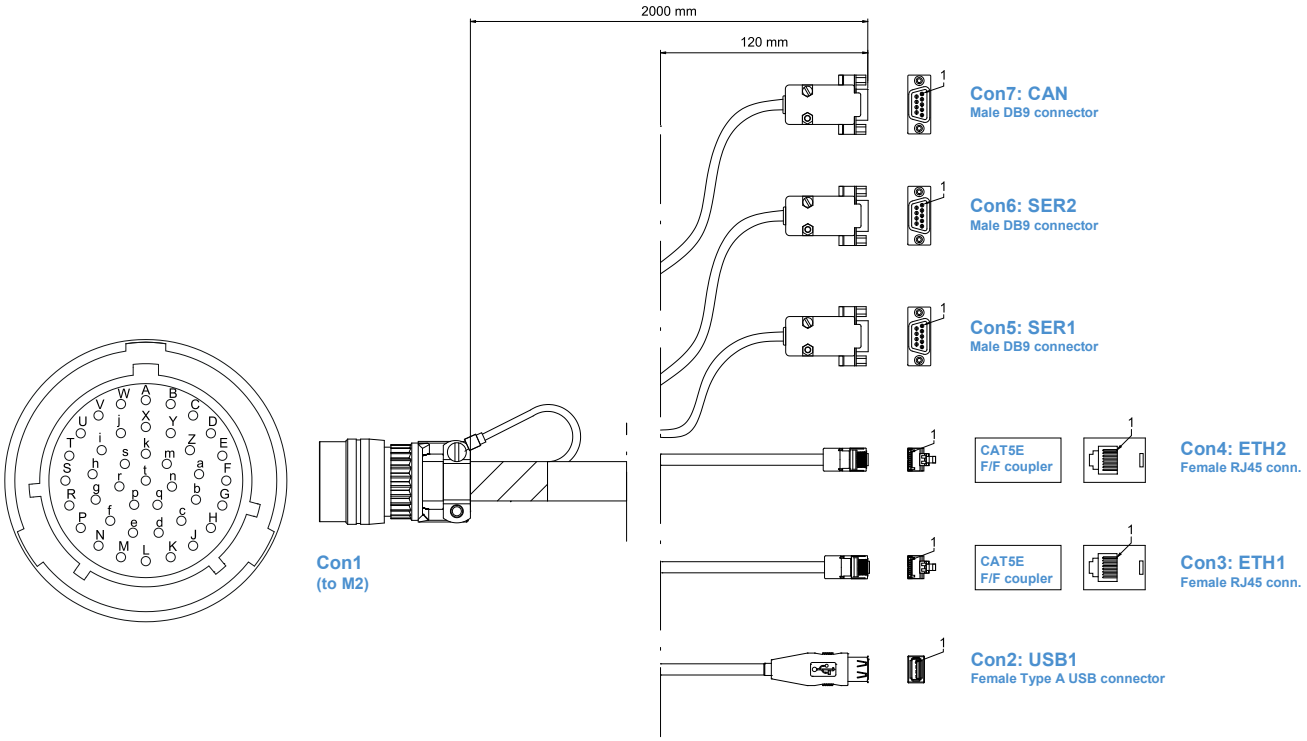
Con1	Signal
A	VIN+ (Con3; Red)
B	Key IN
C	VIN- (Con4; Black)

E14-10-10-00



Con1	Con3: Digital I/O	Con4: USB2	Con5: Microphone In	Con6: Headphone Out	Con7: Speaker Out Right	Con8: Speaker Out Left	Signal
A	1						DIN1
B	2						DIN2
C	3						DIN3
D	4						DIN4
E	5						DIN5
F	6						DIN6
G	7						DIN7
H	8						DIN8
J	9						DIN9
K	10						DIN10
L	11						DIN_GND
M	22						DOUT_GND
N	17						DOUT1
P	18						DOUT2
R	19						DOUT3
S	20						DOUT4
T	21						DOUT5
U			Left				MIC_IN_L
V			Right				MIC_IN_R
W				Left			HP_OUTL
X				Right			HP_OUTR
Y					Left		ROUT+
Z					Right		ROUT-
a						Left	LOUT+
b						Right	LOUT-
c	12						ODOM+
d	13						ODOM-
e			GND	GND			GND
f		1					USB2_+5
g		3					USB2_D+
h		2					USB2_D-
j		4					USB2_GND

E14-11-11-00



Con1	Con2: USB1	Con3: ETH1	Con4: ETH2	Con5: COM1	Con6: COM2	Con7: CAN	Signal	Con1	Con2: USB1	Con3: ETH1	Con4: ETH2	Con5: COM1	Con6: COM2	Con7: CAN	Signal
A		7					ETH1 RX2+	**Y**				7			RTS1
B		8					ETH1 RX2-	**Z**				8			CTS1
C		4					ETH1 TX2+	**a**				9			RI1
D		5					ETH1 TX2-	**b**				4			DTR1
E		3					ETH1 RX1+	**c**				3			TXD1
F		6					ETH1 RX1-	**d**				2			RXD1
G		1					ETH1 TX1+	**e**				1			DCD1
H		2					ETH1 TX1-	**f**				5			GND ISO
J			7				ETH2 RX2+	**g**					6		DSR2
K			8				ETH2 RX2-	**h**					7		RTS2
L			4				ETH2 TX2+	**i**					8		CTS2
M			5				ETH2 TX2-	**j**					9		RI2
N			3				ETH2 RX1+	**k**					4		DTR2
P			6				ETH2 RX1-	**m**					3		TXD2
R			1				ETH2 TX1+	**n**					2		RXD2
S			2				ETH2 TX1-	**p**					1		DCD2
T	1						USB1_+5V	**q**					5		GND ISO
U	3						USB1_D+	**r**						7	CAN_P
V	2						USB1_D-	**s**						2	CAN_N
W	4						USB1_GND	**t**						3	GND ISO
X				6			DSR1								

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Notes

DragonTech
VISION • INNOVATION • CREATION

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