Modular Vision
INSTALLATION, USE AND WARNINGS MANUAL

Edition: 11/2025

REVISION HISTORY

Revision	Date	Note	Rif.
0.0	11.2025	First Official Release	

1. Preliminary information

1.1 Device description

The **Modular Vision** is a modular HMI, based on NXP i.MX93 for entry level Qualcomm QCS5340/6490 , NXP iMX8M Plus, Mediatek Genio 510/700 and finaly Intel Atom for higher levels.

The **Modular Vision** series is a completely newly developed platform concept with scalable HMIs based on **Seco**'s core technologies – Arm and x86. The scalable **Modular Vision** series currently includes three members in sizes of 7, 10.1 and 15.6 inch.

The technology developed by **SECO S.p.A.** can be used and applied in various fields.

1.2 Recipients

This manual is intended for ordinary people and installers (expert users).

IMPORTANT
The user must read this manual before start with any kind of operation.

1.3 Warranty

The warranty shall be **voided** in the event of:

- failure to comply with safety regulations;
- tampering with the device;
- changes to the safety conditions established by the Manufacturer in the device management software;
- improper use of the device;
- use of the device by untrained and/or unauthorized personnel or failure to respect duties, as indicated in the manual;
- changes or repairs carried out by the user without written authorization from the Manufacturer;
- partial or total failure to comply with the instructions;
- defects in the mains power supply (electricity, power supply, etc.);
- poor maintenance;
- use of non-original spare parts;
- exceptional events such as floods, fires (if not triggered by the device).

The complete warranty terms are set out in the sales contract.

IMPORTANT
The Manufacturer is not liable for improper use of the device.

2. Identification

2.1 Manufacturer identification

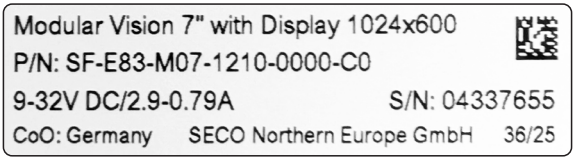
MANUFACTURER	**SECO Northern Europe GmbH**
Address	Schlachthofstraße 20 21079 Hamburg - Germany Tel. +49 40 79189930

2.2 Device identification

Device	Modular Vision (7", 10,1", 15,6")
Serial number	XXXXXXXX
Year of manufacturing	WW/YY

2.3 Device identification plate

The device is equipped with an **identification plate** located on the side. The plate features the device identification information to be reported to **SECO S.p.A.** if necessary, as shown in the table:



CAUTION
It is strictly forbidden to remove the identification plate and/or replace it with other plates.

3. Technical specifications

3.1 Modular Vision device hardware specifications

The table below features the board hardware specifications:

Modules	**SOM-SMARC-MX8M-Plus** NXP i.MX8M Plus family SoCs: Dual or Quad ARM Cortex A53 + Cortex M7 (default quad core) on SMARC module **SOM-SMARC-ASL** Intel Atom® Processors x7000RE Series (Codename: Amston Lake): 2 cores (x7211RE) up to 8 cores (x7835RE) **SOM-SMARC-QCS6490** Qualcomm® DragonwingTM QCS6490 processor:1x Arm® Cortex®-A78 @2.7 GHz, 3x Arm® Cortex®-A78 @2.4 GHz, and 4x Arm® Cortex®-A55 @1.8 GHz **SOM-SMARC-QCS5430** Qualcomm® DragonwingTM QCS5430 processor: 2x Arm® Cortex®-A78 @2.4 GHz, 4x Arm® Cortex®-A55 **SOM-SMARC-ADL-N** Intel® Atom® x7211E, 2 Cores @1.0 GHz (3.2 GHz Turbo), 6W TDP, with TSN and TCC* **SOM-SMARC-MX93** NXP i.MX93 family SoCs: Dual core ARM Cortex-A55 + ARM Cortec-M33 on SMARC module **SOM-SMARC-Genio700** MediaTek Genio700: 2x Arm® Cortex®-A78 @ 2.2 GHz + 6x Arm® Cortex®-A55 @ 2.0 GHz on SMARC module **SOM-SMARC-Genio510** MediaTek Genio510: 2x Arm® Cortex®-A78 @ 2.2 GHz + 4x Arm® Cortex®-A55 @ 2.0 GHz on SMARC module
Memory	Soldered-down LPDDR4X/LPDDR4-3200 memory, up to 2GB total, 16-bit interface Soldered-down LPDDR5-6400 memory, up to 8 GB total, 32-bit interface 2 channels Soldered down LPDDR4-4000 memory, 32-bit interface, up to 8 GB
Graphic	**IMX93** AI/ML acceleration, 2D PXP
	QCS5430/6490 Qualcomm® Adreno™ 643L
	iMX8M Integrated Graphics Processing Unit GC7000UL
	Genio510/700 Mali-G57 MC3 GPU
	Intel Atom Integrated Intel UHD Graphics driven by Intel Xe architecture

Audio	Speaker output, mono, up to 3 Watt RMS
Peripherals	SD card, I2C, ADC, GPIO, CAN Bus, UART/RS232
Video Resolution	7.0" display, resolution 1024 x 600, LED lifetime 50K hours, 400cd/m² brightness 10.1" display, resolution 1280 x 800, LED lifetime 50K hours, 400cd/m² brightness 15.6" display, resolution 1920 x 1080, LED lifetime 30K hours, 400cd/m² brightness P-Cap (Projected Capacitive touch screen), with 3.0mm chemically strengthened cover glass
Mass Storage	eMMC up to 64 GB (default 8 GB or 16 GB) soldered down on SMARC module microSD Card slot, Customer accessible
Networking	1x 1 GB UFS based Ethernet on RJ45 Customer accessible
USB	1x USB 2.0 Type-C Dual Role functionality, 0.5A out. 1x USB 3.0 Type A socket, 0.9A out (availability depends on SMARC Module)
Serial Ports	2x RS232 (1 of the RS232 may also be configurable as MDB interface) 1x RS485 Half/Full Duplex 1x CAN (-FD, depending on CPU SKU on SMARC)
Other Interfaces	1x I²C, SPI, 2x Digital In, 2x Digital Out
Power	$+9V_{DC} \div +24V_{DC}$
Operating System	Clea OS
Dimensions	7":201.6 x36.2 x 127.6mm 10.1": 270.1 x 51.7 x 187.1mm 15,6": 407.5 x 52.4 x 259.5 mm
Mounting Options	· Vesa mount (only available for 15.6" version) · Wall mount/Flash mount/Panel mount
Operating Temperature	0°C ÷ +60°C*
Relative Humidity	5 ÷ 95% @60°C (non-condensing)
Front Panel Protection	IP66

ATTENTION
***Measured at any point of the heatspreader/heatsink during any and all times (including start-up). Actual temperature will widely depend on application, enclosure and/or environment. Upon customer to consider specific cooling solutions for the final system to keep the heatspreader temperature in the range indicated.**

3.2 Software Specifications

The software version released on the website **https://developer.seco.com/hardware/product/hmi-solution/modular-vision** which is always updated and available, even in later versions.

3.3 CE reference directives

The device has been designed according to the following Directives:

- **2014/30/EU** Electromagnetic Compatibility Directive.
- **2009/125/CE** Ecodesign
- **2012/19/EU** (WEEE)
- **2011/65/EU** (RoHS)

The device also meets the requirements of the following standards:

- **EN 62368-1, EN 61010-1.**

3.4 Product Documentation

SECO S.p.A. places the device on the market, equipping and providing it with:

- **CE marking as IT device**
- **UKCA**
- **Declaration of Conformity***
- **User manual***
- **FCC - Part 15 Certification****

*These documents are available after a request to the manufacturer.

3.5 FCC disclaimer

FCC ID: 2ALZB-SYSD47IOT

This device complies with Part 15 of FCC Rules, Operation is Subject to following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received including interference that cause undesired operation.

** This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions,

may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help.

CAUTION
No changes shall be made to the equipment without the manufacturer's permission as this may void the user's authority to operate the equipment

IMPORTANT
The Manufacturer is not liable for improper use of the device.

4. Safety devices

4.1 Warnings

CAUTION
It is the user's responsibility to apply preventive and protective measures, in accordance with the legislation of the country of installation and use of the device.

CAUTION
Only use the accessories supplied by the manufacturer.

CAUTION
Only connect certified peripherals / devices to the device.

CAUTION
Always disconnect the electrical power supply before carrying out any work on the device.

CAUTION
Check that the electrical voltage meets the values indicated in this manual before connecting the device.

CAUTION
Disconnect the device from any power source before cleaning.

CAUTION
Do not use liquid detergents or sprays for cleaning the device.

CAUTION
Do not pour liquids of any kind on the device. This may cause fires and/or electric shocks.

CAUTION
Keep the device away from exposure to moisture values outside the admissible range indicated in this manual.

CAUTION
It is strictly forbidden to modify the appliance in order not to compromise the characteristics relating to the declared requirements.

CAUTION
No changes shall be made to the equipment without the manufacturer's permission as this may void the user's authority to operate the equipment.

Whenever handling the device, ground yourself through an anti-static wrist strap. Placement of the board on an anti-static surface is also highly recommended.

Always switch the power off, and unplug the power supply unit, before handling the board and/or connecting cables or other boards.

Avoid using metallic components - like paper clips, screws and similar - near the board when connected to a power supply, to avoid short circuits due to unwanted contacts with other board components.

If the board has become wet, never connect it to any external power supply unit or battery.

Check carefully that all cables are correctly connected and that they are not damaged.

Batteries should not exceed the storage temperature of -20/+40°C and a relative humidity of 60±15%. Danger of explosion if the battery is replaced with another one of the wrong type. Batteries must be disposed of as required by the European directive.

4.2 Safety pictograms affixed on the device and used in the manual

The device and the manual are equipped with symbols, as indicated in the table below:

PICTOGRAM	DESCRIPTION
	**CE marking**
	**WEEE /RAEE** Indicates the separate collection of electronic and electrical equipment according to Directive 2012/19/EU.
	Symbol used to indicate the need to consult the instruction manual before using the equipment.
	Symbol used to identify important warnings for the safety of the user and/or of the device.
	Warning! Read the manual before use.
	**FCC marking**

5. Characteristics and components of the device

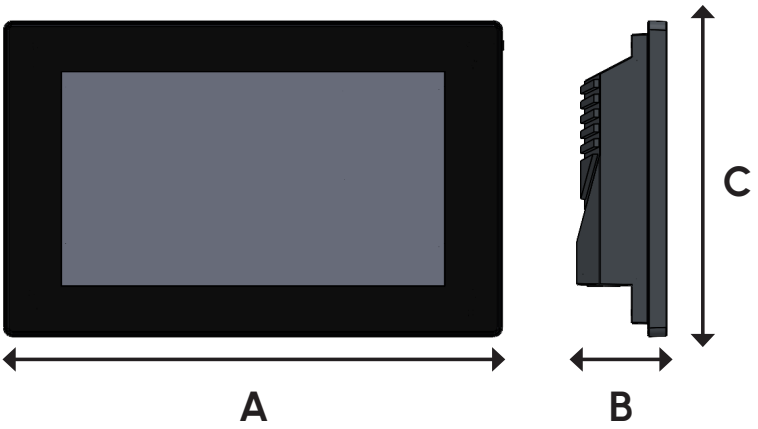
The **Modular Vision** is a modular HMI, based on NXP i.MX93 for entry level Qualcomm QCS5340/6490 , NXP iMX8M Plus, Mediatek Genio 510/700 and finaly Intel Atom for higher levels.

The **Modular Vision** series is a completely newly developed platform concept with scalable HMIs based on **Seco**'s core technologies – Arm and x86. The scalable **Modular Vision** series currently includes three members in sizes of 7, 10.1 and 15.6 inch.

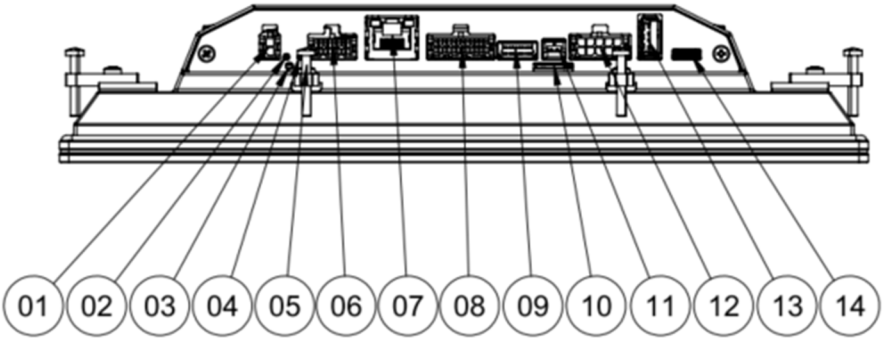
On **Modular Vision** there are several connectors located on the lower part of the enclosure. Moreover, there is a hardware reset button and a Boot Select Switch, additional two LEDs for Power and Status

5.1 Measurement layout

	7"	10.1"	15.6"
Length (A)	201,6 mm	270,1 mm	407,5 mm
Width (B)	36,2 mm	51,7 mm	52,4 mm
Height (C)	127,6 mm	187,1 mm	259,5 mm
Cut out dimensions min. +0,5mm			



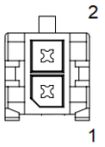
5.2 Connectors



POS.	Description
01	Power
02	Power LED
03	Reset Switch
04	Status LED
05	Clearall Switch
06	Digital I/O
07	Ethernet
08	CAN/RS485 Interface
09	Keypad/SPI
10	SD-Card reader
11	Speaker
12	RS232 /MDB
13	USB-Host
14	USB-OTG

5.3 Connectors description

POWER - Connector 01	
Pin	**Signal**
01-1	Vin -
01-2	Vin +



POWER Connector 01
The Modular Vision System can be powered By a 9V- 32V DC – 50W Powersupply

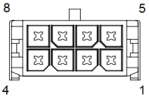
Power LED 02
The Power LED will be green when power on.

RESET button 03
The RESET Switch is used for reboot the system..

Status LED 04
The Status LED shows the Status of the Modular Vision System.

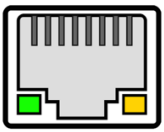
Clearall Switch 05
Possibility to activate a Software controlled cleaning process

GPIO - Connector 06	
Pin	**Signal**
06-1	GPIO9
06-2	GPIO8
06-3	GND
06-4	Vin-
06-5	GPIO11
06-6	GPIO10
06-7	VCC_DIO
06-8	Vin+



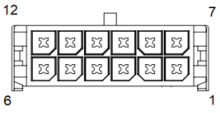
DIO Connector 06
DIO Connector 06 is a micro-Fit connector, 2x4 poles, type MOLEX MicroFit 43045-0800 or equivalent.
This connector offers the following possibilities (all signals are electrical level 3.3V and 3.6V tolerant):

LAN RJ45- Connector 07	
Pin	**Signal**
07-1	MDI0+
07-2	MDI0-
07-3	MDI1+
07-4	MDI1-
07-5	MDI2+
07-6	MDI2-
07-7	MDI3+
07-8	MDI3-



Ethernet Connectors 07
The Modular Vision system offers a RJ45 Ethernet connector with LED for Speed and Link act.

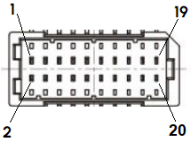
CAN /RS485 – Connector 08	
Pin	**Signal**
08-1	GND
08-2	CAN_H_Term.
08-3	CAN_H
08-4	CAN_L
08-5	CAN_L_Term
08-6	----
08-7	GND
08-8	----
08-9	RS485_Y
08-10	RS485_Z
08-11	RS485_A
08-12	RS485_B



CAN/RS485 Interface - Connector 08

The CAN interface is available on connector 08, which is a micro-Fit connector,2x6 poles, type Molex MicroFit 43045-1200 or equivalent. Mating connector MOLEX 43025-1200 or equivalent with 43030 series Female Crimp terminal.
This connector offers a CAN-Bus connection (with / without termination) and there is a RS485 connection (with / without termination).

Keypad / SPI – Connector 09	
Pin	**Signal**
09-1	GND
09-2	GND
09-3	IO3
09-4	IO4
09-5	IO5
09-6	IO6
09-7	IO7
09-8	IO8
09-9	IO9
09-10	IO10
09-11	I2C_GP_DAT_3V
09-12	I2C_GP_CK_3V
09-13	IO13
09-14	SS1
09-15	MISO
09-16	MISI
09-17	SCLK
09-18	SS0
09-19	VCC
09-20	VCC



Keypad/ SPI Connector 09

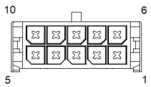
Jst SHD 1.0 20Pin

SD-Card Reader 10

Speaker Connector 11	
Pin	**Signal**
11-1	Speaker +
11-2	Speaker -

Speaker connector 11
The speaker interface is available on a JST connector 2-Pin , type JST PH 2.0

Serial Port/MDB interface – Connector 12		
Pin	**RS-232 Signal**	**MDB Signal**
12-1	GND	GND
12-2	RS232_TXD1	
12-3	RS232_RXD1	
12-4	RS232_RTS1	
12-5	RS232_CTS1	
12-6	GND	GND
12-7	RS232_TXD2	TXD
12-8	RS232_RXD2	RXD
12-9	RS232_RTS2	
12-10	RS232_CTS2	



Serial Port/MDB Interface Connector 12
The Serial Port interface is available on a micro-Fit connector,2x5 poles, type MOLEX 43045-1001 or equivalent. Mating connector MOLEX 43025-1000 or equivalent with 43030 series Female Crimp terminal.

LAN RJ45- Connector 07	
Pin	**Signal**
13-1	USB0_VCC
13-2	USB0-
13-3	USB0+
13-4	GND

USB-Host 13

LAN RJ45- Connector 07	
Pin	**Signal**
14-A1 / B1	GND
14-2	TX1+
14-3	TX1-
14-4	VBUS
14-A5 / B5	CC
14-A6 /b6	D+
14- A7 /B7	D-
14 – A8 /B8	SBU
14-A9 /B9	VBUS
14-A10 / B10	RX2-
14-A11 / B11	RX2+
14-A12 / B12	GND

USB-OTG 14

6. Installation

6.1 Permitted environmental conditions

Use of the device and of associated control systems that differ from those listed below is **not** permitted.

In particular, the installation and operation environment must **not** be:

- Exposed to environmental temperatures exceeding 0 °C. to + 60 °C.
- Exposed to limit areas of 2,000 m.a.s.l.
- Exposed to excessive humidity (minimum 5%, maximum 85 %) and rapid changes in relative humidity (above 0.005 p.u./h).
- Front protection rating IP66.
- Exposed to corrosive fumes.
- Exposed to excessive dust.
- Exposed to abrasive dust.
- Exposed to oil vapours.
- Exposed to powder or gas explosive mixtures.
- Exposed to salt air.
- Exposed to vibrations, impacts or abnormal shocks.
- Exposed to weather conditions beyond the limits permitted or dripping.
- Exposure to unusual transport or storage conditions.
- Exposure to high or rapid thermal changes (above 5K/h).
- Presence of nuclear radiation.
- The conductors of the command and control circuits directly connected to the supply voltage must be protected against overcurrents.
- The conductors of the command and control circuits fed by a transformer or by a DC supply must be protected against overcurrent.
- In command and control circuits connected to a protective equipotential circuit, the requirement is satisfied by inserting a protective device against overcurrents in the isolated conductor.

CAUTION
Environmental conditions that differ from those specified may seriously damage the device. Positioning the device in environments that do not correspond to those indicated shall render the warranty null and void for the parts to be replaced.

SECO S.p.A. shall not be held liable if these instructions are not complied with.

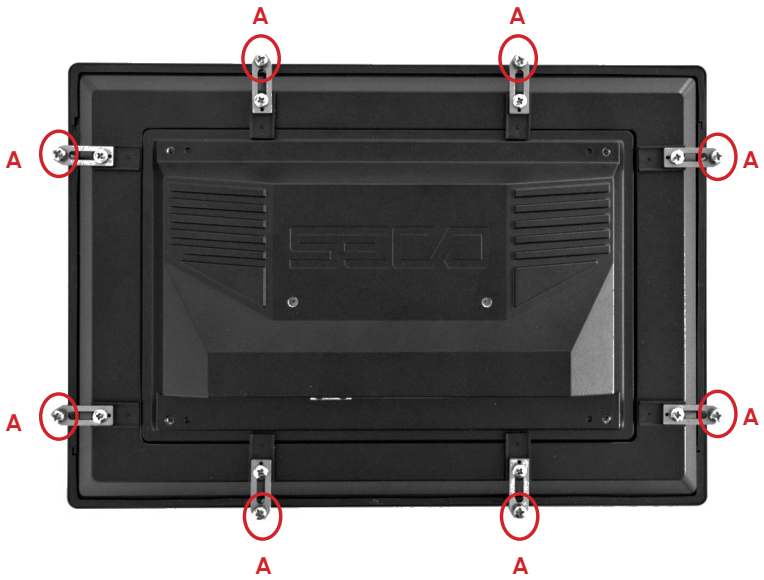
6.2 Installing the device

CAUTION
The power supply must have this values:
- **Voltage: +9V ÷ +24V**
- **Current: 5 A max**

SECO S.p.A. shall not be held liable if these instructions are not complied with.

To install the device properly on **machine/wall/sheet/other support,** follow the procedure below:

1	Make sure the electric connection on the destination machine is off and the electric power supply is disconnected from the device;
2	Fix the device to the existing support using the screws that will be screwed in matching the holes **(A)** in the plate (4 to 10 screws depending to the device size);
3	Proceed to connect the electric supply to the device.
4	Proceed to electrically connect the destination machine.



To install the device properly on **machine/wall/sheet/other** with **VESA** support, follow the procedure below:

1	Make sure the electric connection on the destination machine is off and the electric power supply is disconnected from the device;
2	Proceed to fasten the device to the standard **VESA support** screwing the screws in correspondence of the plate holes **(A)**;
3	Proceed to connect the electric supply to the device;
4	Proceed to electrically connect the destination machine.

SECO S.p.A. shall not be held liable if these instructions are not complied with.

6.3 Versions available

The **Modular Vision** device is available in different versions that integrate various configurations.

Below the table with the main configurations of the device:

SF-E83-M07-1210-0010-C0	I MX8M Plus Panel Mount 12V/Battery/i.MX8M Plus QUAD 1.6GHz,VPU,NPU,ISP,CAN- FD,HiFi4 / 8GB RAM / 64GB eMMC / Secure Element
SF-E83-M10-1210-0010-C0	
SF-E83-M15-1210-0010-C0	
SF-E83-M10-1410-0000-C0	ASL Panel Mount 12V/Battery/ Alder Lake N Core i3-N305, 8 core, up to 3.80 G Hz / 16GB RAM /64GB eMMC /TPM
SF-E83-M15-1410-0000-C0	
SF-E83-M07-1410-0000-C0	IMX93 Panel Mount 12V/Battery/ i.MX93 Dual 1.7G Hz / 2GB RAM /32GB eMMC /TPM
SF-E83-M10-1710-0000-C0	QCS Panel Mount 12V/Battery/ QCS5430 / 8GB DDR /128GB UFS /CAN/TPM
SF-E83-M15-1B10-0000-C0	QCS Panel Mount 12V/Battery/ QCS6490 / 8GB DDR /128GB UFS /CAN/TPM

7. Maintenance

User should clean the product with a dry cloth when necessary, based on his visual inspection.

CAUTION
Disconnect the device from any power source before cleaning operation.

WARNING
The enclosure of the device must be cleaned only with a dry cloth.

After cleaning, the user should check that the product is still correctly installed.

8. Waste disposal

Electrical equipment no longer in use must not be thrown away with normal municipal waste. The substances and materials it contains must be disposed of separately in an appropriate manner.
The device must be disposed correctly as it is a waste of electric and electronic equipment (WEEE).

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