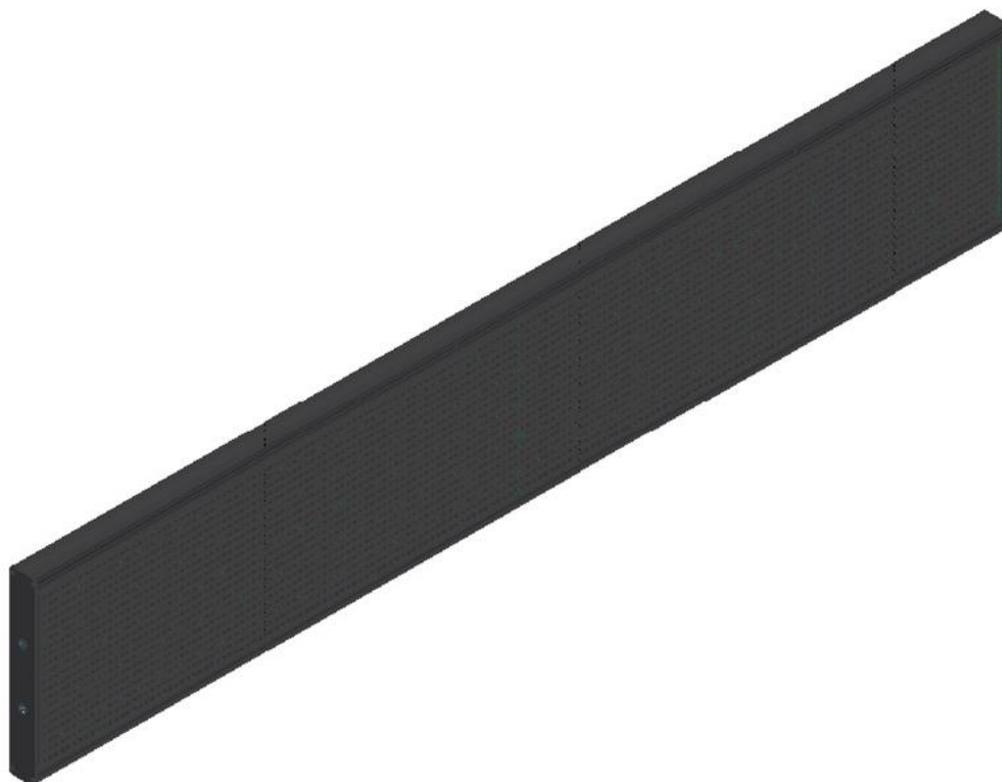


USER AND MAINTENANCE MANUAL



DISPLAY SERIES MINERVA MONOCHROMATIC

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PRODUCT CODE			DIMENSIONAL DRAWING	
---			Refer to the enclosure for this series of VMS	
REL	DATE	PREPARED BY	APPROVED BY	LANGUAGE
00	08 March 2017	Ashwani Klair		English
01	26 March 2018	Ilyasse El Guelta	Simone Farina	English

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1. INTRODUCTION

1.1 Conventions used in this manual

This user and maintenance manual employs a set of conventions to facilitate its use and comprehension and the identification of the information it provides. Here below the list:

Convention	Meaning
Aesys	AESYS S.p.A.
Manufacturer/producer	To be understood as AESYS S.p.A.
Display / Panel / VMS	To be understood as “Variable Message Sign”.
Client / purchaser / user	The owner of the Panel supplied by Aesys S.p.A.
Matrix	The front part of the panel composed of LED, where messages are displayed.
PPE	Personal Protective Equipment.
	General information.
	Important information.
	Important safety information: please read carefully.
	Important information about electrical/electronic components: please read carefully.
	Important information about improper or hazardous conduct: please read carefully.
	Information on the disposal of industrial waste.

1.2 Purpose of this document

This document describes the construction, electrical hook-up, use and maintenance of displays of “Series Minerva Monochromatic”. In detail, it includes general, legal and environmental information, handling and installation instructions, the characteristics of the sign, safety and scheduled and occasional maintenance instructions, information about the warranty, and the spare parts list.

A number of documents are enclosed with the manual which give specific information on the dimensions and settings, the electronic components, and quality control reports.



Note: this user manual is provided for information only. Aesys is not liable for any direct or indirect damage resulting from the use of this manual.

This manual is an integral part of the display, if you lose or damage it; please contact Aesys for a digital copy (PDF) as the contact numbers are given in *para 7.1*.



Note: the information given in this manual is subjected to modification and updating without notification.



Note: no part of this document may be reproduced or divulged to third parties without written authorization from Aesys.

1.3 Manufacturer’s identifying data

This VMS has been designed by Aesys, which holds all rights relating to the conception, design, technologies, industrialization and production of this panel;

- **Headquarters:** V. Pastrengo 7/C – 24068 SERIATE (BG) - ITALY
- **Head offices:** V. Artigiani, 41 – 24060 BRUSAPORTO (BG) - ITALY
- **Factory 1:** V. Pastrengo 7/C – 24068 SERIATE (BG) - ITALY
- **Factory 2:** V. Ca’ Bertoncina – 24068 SERIATE (BG) - ITALY
- **Factory 3:** V. Artigiani, 41 – 24060 BRUSAPORTO (BG) - ITALY
- **Factory 4:** V. San Domenico – 24060 BRUSAPORTO (BG) - ITALY

Aesys can be contacted as follows:

www.aesys.com
info@aesys.com
Tel + 39 035 29 240
Fax +39 035 68 00 30

These contacts are available Monday to Friday for technical assistance during the company's working hours. Moreover, Aesys has additional offices located in several countries: for more details, please visit www.aesys.com.



Note: for any technical assistance please contact aesys as per the reference given in *para 7.1 "Aesys"*.

1.4 Intellectual and Industrial Property Rights

This display is the work of the intellect of Aesys who is the holder of all rights relating to conception, design, design, technologies employed, industrialization and the production of this display. The drawings, designs, images, trademark and prototypes of this display are and remain the exclusive property of Aesys. Any improper or illegitimate use unauthorized by Aesys will be reported to the authorities to protect Aesys's rights.

1.5 Aesys in terms of Quality and Safety

The company Aesys S.p.A, through its integrated management system, ensures that the entire process of the fabrication of all its products (designing, production, testing, and handling/storage) is implemented with maximum control in respecting the rules and regulations envisaged applicable at the product, environment, Health & safety at work.

To ensure this, aesys has obtained the certification of **ISO 9001** (Quality management System), **ISO 3834-2** (Quality of welded metal assemblies), **ISO 14001** (Environment) and **OHSAS 18001** (Health and Safety at work) from their respective authorities.

2. SAFETY CRITERIA

During the designing and constructional phase of these displays, all the suitable measures and important criteria have been adopted to satisfy the essential requisites of the following directives:

- Low Voltage Directive;
- Electromagnetic Compatibility Directive.



Note: Aesys is not liable for any damage or injury resulting from failure to observe the safety instructions and recommendations given in the documentation.



Note: Aesys is not liable for any damage or injury resulting from the messages displayed by the user on the VMS.

2.1 General instructions

Please read this manual carefully before installing, activating, using, servicing or working on these VMS in any way. Do not allow inadequately trained staff to work on them.

Operators working on these VMS must use suitable PPE, such as boots, reflective jackets, helmets, eye glasses, gloves, etc.



Caution: Aesys declares that the purchaser is responsible for the operations done on the panel, if he fails to observe the instructions given in this manual.



Note: observing standards and using safety equipment properly enable the operator to work in the best conditions without the risk of injury to anyone.

The VMS should be checked periodically for its correct functioning and presence of the safety guards. And if not found so, it should be reported to the responsible person/supervisor immediately so that a timely action should be taken in order to restore the proper safety guards and correct functioning of the panel.



Caution: do not remove, deactivate or tamper with any safety and protection equipment; doing so not only voids the warranty, but Aesys in no way remains liable for the consequences.



Caution: never work on the display while it is connected to its electrical power supply.

2.2 Suitability of operators and maintenance staff

The operators who are in charge of using these displays must be at least 18 years old and recognized by the owner of the display as psychologically and physically fit to fulfill their responsibilities.



Note: the purchaser and user of the display must train his staff appointed to operate on and servicing this panel and also about the safety equipment.



Caution: Aesys is not liable for any damage or injury resulting from use by unqualified operators.

Aesys may agree to provide supplementary instructions to the operating staff through the supervision of its own technical staff. Such services will be agreed upon after being defined in a separate contract.

Operators according to their responsibilities are classified as follows.

2.2.1 User

Definition: a person in charge of sending the messages to VMS from a PC (Personal Computer) located in a Remote Operations Centre:

- must be instructed well to use the software connecting to the VMS by training or initial supervision;
- He is not authorized to work on electrical or mechanical equipment of the VMS.

2.2.2 Mechanic

Definition: a person in charge of doing mechanical maintenance, adjustments, replacements and repairs:

- A skilled mechanic, able to service the mechanical assemblies safely and satisfactorily, due to his theoretical knowledge and practical experience;
- He is not authorized to work on electrical equipment of the VMS.

2.2.3 Electrician

Definition: a person in charge of doing electrical/electronic maintenance, adjustments, replacements and repairs:

- A skilled electrician/electronic technician, able to service the electrical and electronic systems safely and satisfactorily, due to his theoretical knowledge and practical experience;
- He is not authorized to work on mechanical equipment of the VMS.

2.3 Safety Regulations and Standards

Fully observance of the safety standards, not only enables the operator to work effectively and confidently, but also without any risk of injury to him or to others. In addition:

- make sure to shut off power (through the appropriate circuit breakers) when doing maintenance, replacements or repairs of electrical equipment;
- Make sure that the panel is installed on an adequate support that is suited to the operating conditions and any existing risks (tampering, vibration, etc.), and verified by structural calculations complying with the regulations in force;
- Provide adequate lighting when working on the panel.



Caution: when working on the panel, do not remove its guards or safety equipment.

During normal use, the following instructions must be observed:

- Always follow the procedures given for maintenance and technical assistance;
- Keep a record of the dates and results of periodic inspections of the display;
- Never use petrol, solvents or other flammable fluids to clean the display;
- Use protective eye glasses with side guards in case of using compressed air (whether supplied in a canister or compressor) for cleaning, and limit the pressure strictly to the necessary value;
- Do not use open flames as a means of illumination;
- Make sure that all live parts of the electric circuits are intact and in good working condition.



Note: Aesys is not liable in any way for accidents, damage, or injury to persons or animals resulting from any failure to observe the precautions stated, or by the removal of safety equipment or failure to use the prescribed PPE.

2.4 Scrapping

This Aesys panel is designed according to the criteria that are in compliance with the objective of efficiency and eco-sustainability, and its materials and/or power are largely recyclable, reusable and recoverable. It has been fabricated in a way to have minimum industrial wastage.

The panel nonetheless contains products and substances which, upon dumping the panel in open, would contaminate the environment. It is mainly composed of aluminum, steel, electrical cables, printed circuit boards, tinned copper, mono-component adhesive sealant, neoprene tape, paint, batteries, and generic electrical material.

When scrapping the panel or any part of it, to prevent environmental and health hazards due to improper disposal, the product and its accessories should be subjected to sort waste disposal and recycling to promote the sustainable reuse of its materials as provided by the law.



Note: always consult the local industrial waste disposal regulations in the country of use.

In particular, during the disposal:

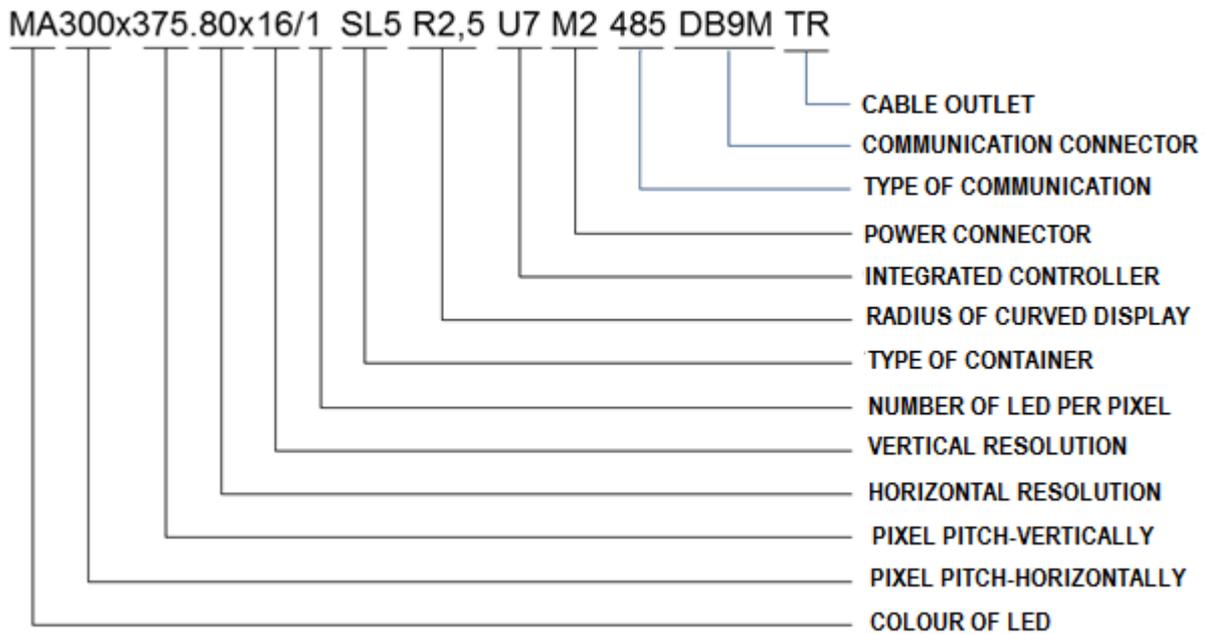
- Avoid all damage and hazards to the health, safety and well-being of individuals and the population;
- Enforce the observance of hygiene and health regulations and avoid any risk of polluting the air, water, ground and soil, as well as any disturbances due to noise and odors;
- Safeguard the local flora and fauna and avoid damaging the environment and landscape;
- Observe economic and territorial planning requirements.

Chapter
3

3. BASIC INFORMATION ABOUT THE DISPLAYS OF SERIES MINERVA

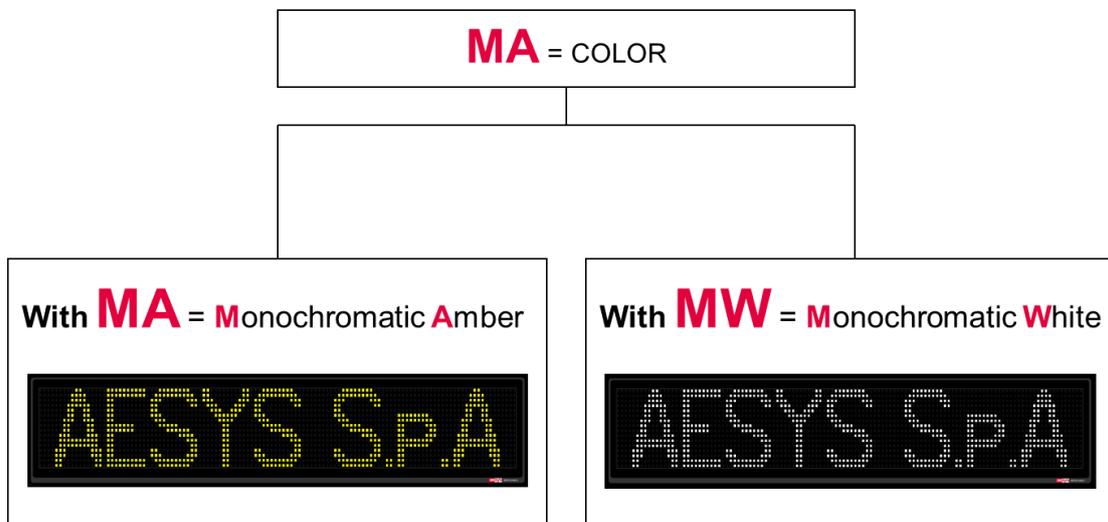
3.1 Introduction

The VMS of this series are of different typology, which can be identified by their Part Number.



3.1.1 Colour of LED

The LED used for VMS of this series is of two colours i.e. White and Yellow amber



3.1.2 Pixel Pitch

300x375 = Horizontal x Vertical PIXEL PITCH

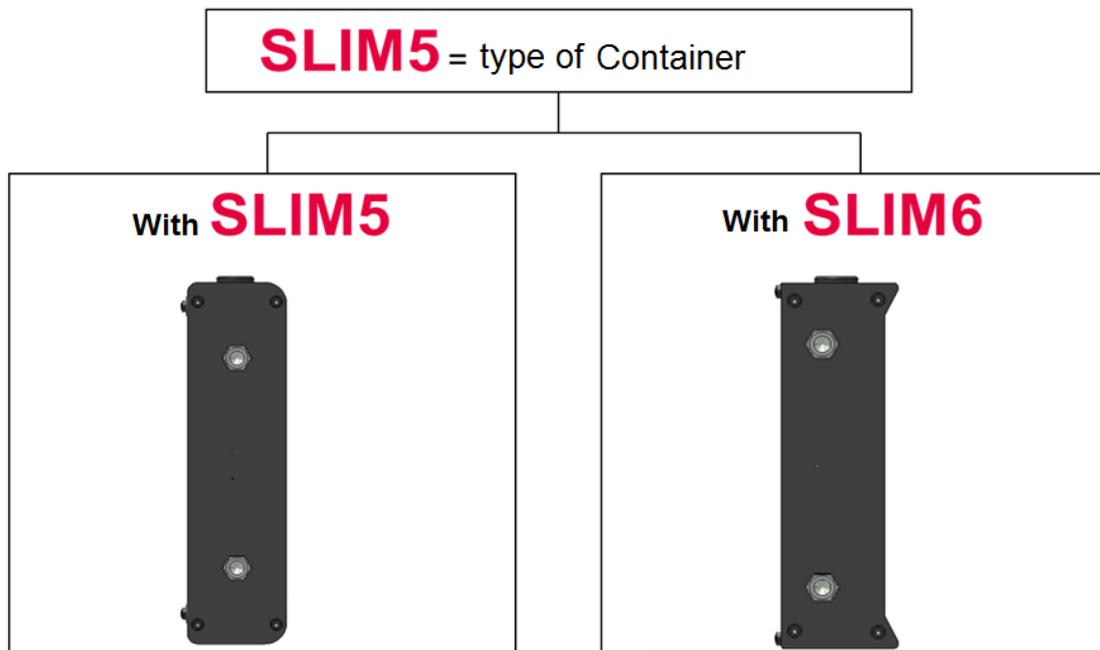
275x342 = 275mils x 342mils = 7.00mm x 8.70mm	
300x300 = 300mils x 300mils = 7.62mm x 7.62mm	
300x375 = 300mils x 375mils = 7.62mm x 9.53mm	
350x400 = 350mils x 400mils = 8.89mm x 10.16mm	
375x375 = 375mils x 375mils = 9.53mm x 9.53mm	
400x400 = 400mils x 400mils = 10.16mm x 10.16mm	
400x500 = 400mils x 500mils = 10.16mm x 12.70mm	
408x512 = 408mils x 512mils = 10.38mm x 13.00mm	

3.1.3 Matrix Resolution

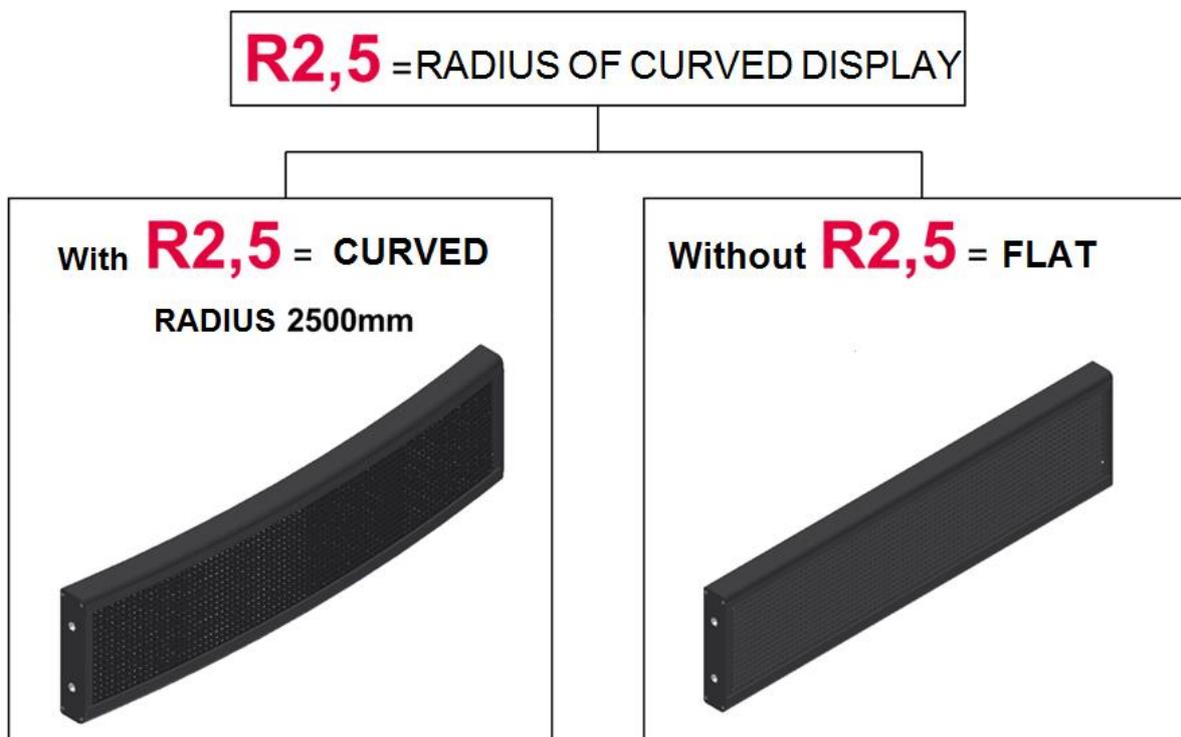
80x16 = Horizontal x Vertical RESOLUTION

Orizzontale:	Verticale:
200 pixel	24 pixel
170 pixel	20 pixel
160 pixel	16 pixel
120 pixel	8 pixel
96 pixel	
80 pixel	
40 pixel	

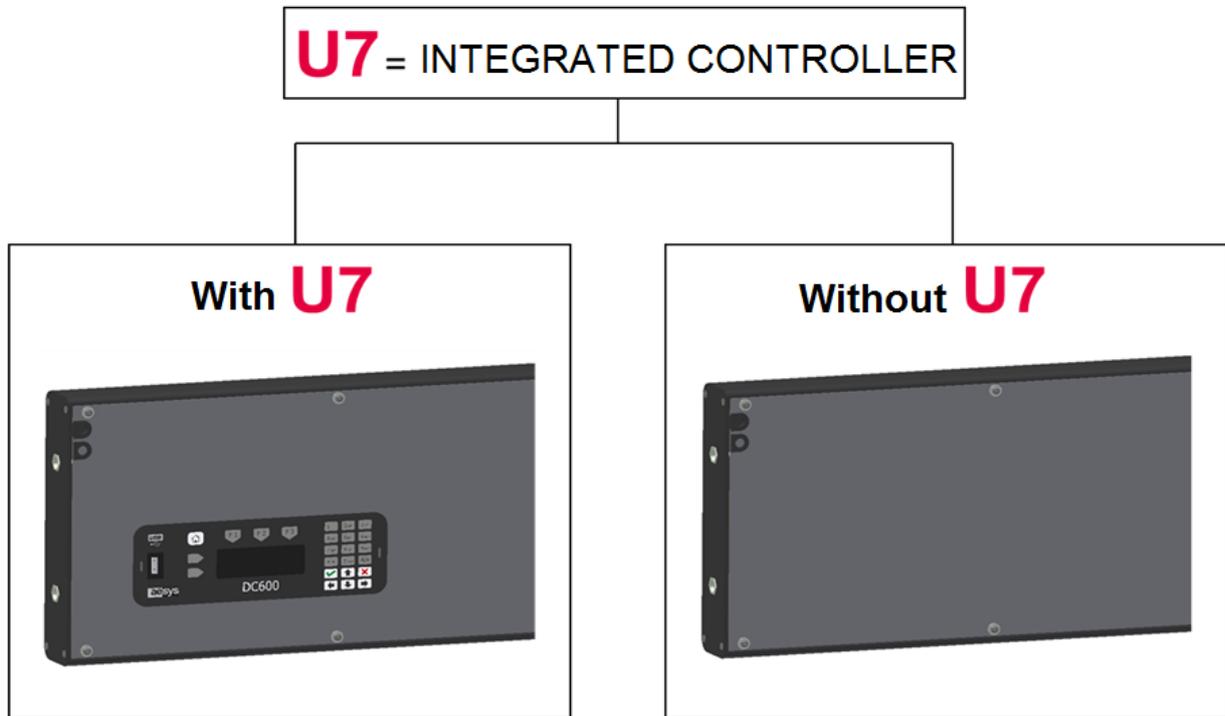
3.1.4 Type of Container



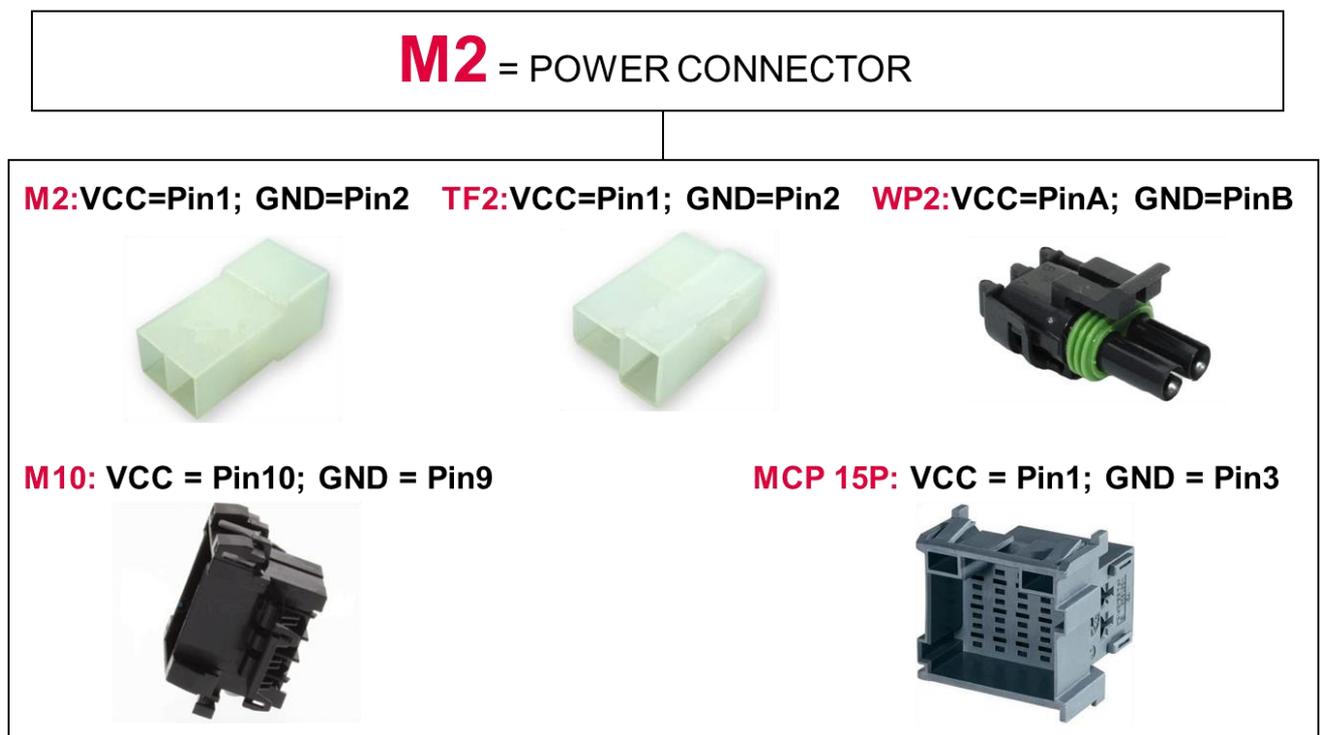
3.1.5 Shape of Container



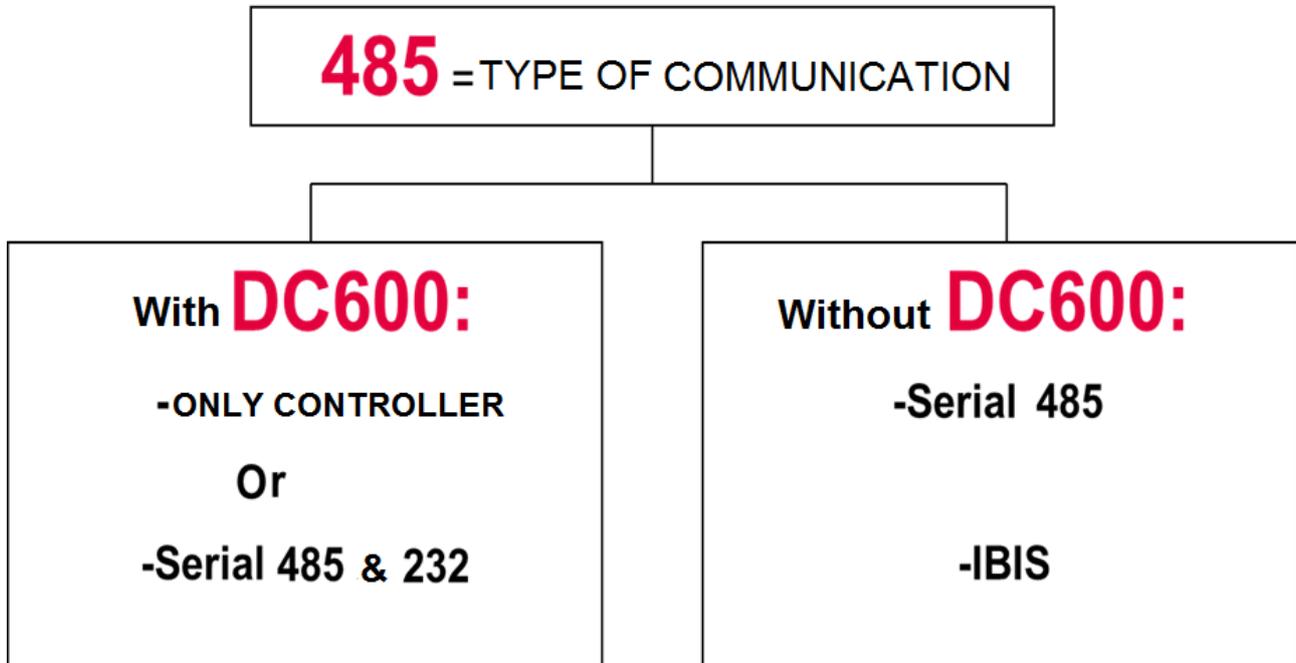
3.1.6 Controller DC600



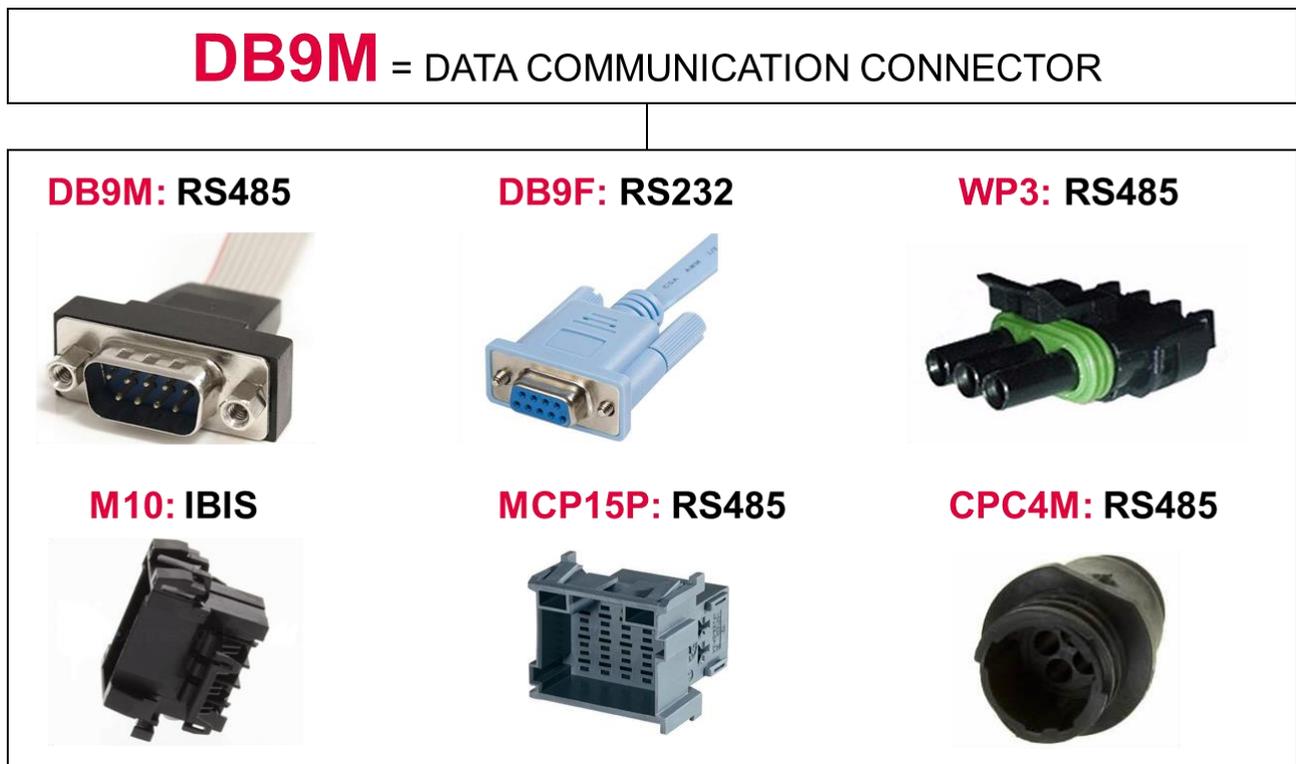
3.1.7 Power Connectors



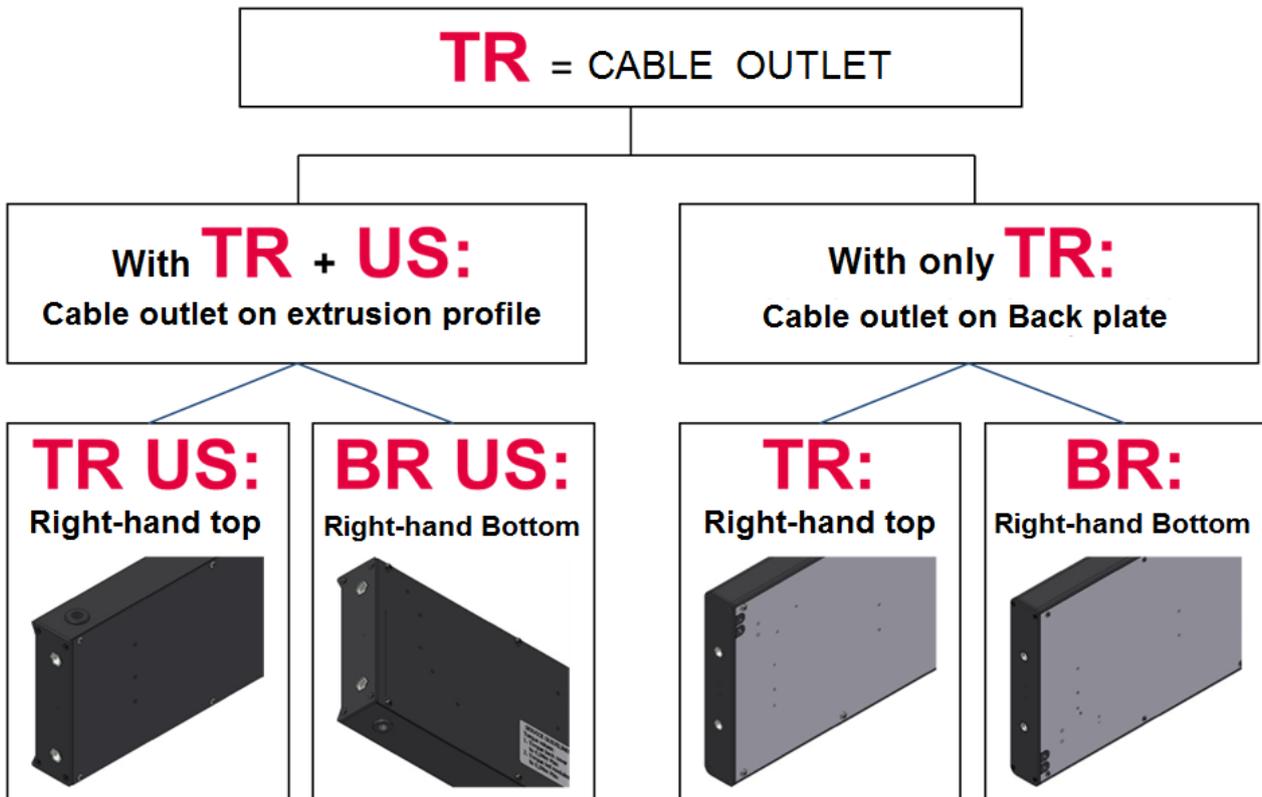
3.1.8 Type of DATA Communication



3.1.9 Connectors for DATA Communication



3.1.10 Cable outlet



3.2 Use

The VMS of series Minerva are employed in the public transportation to provide information to the passengers in transit: Therefore they are installed in highly aggressive conditions.

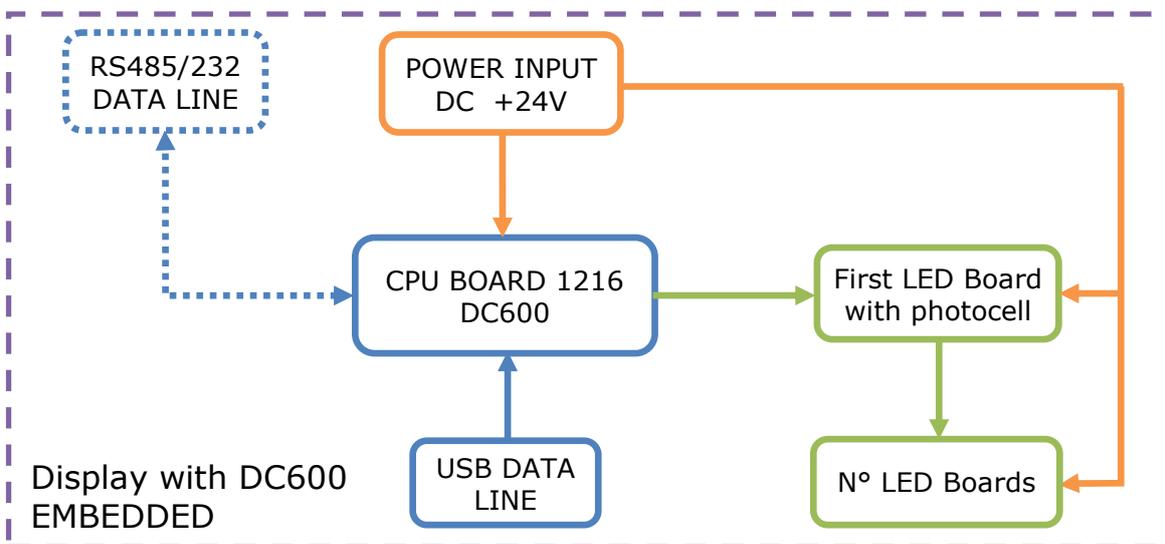
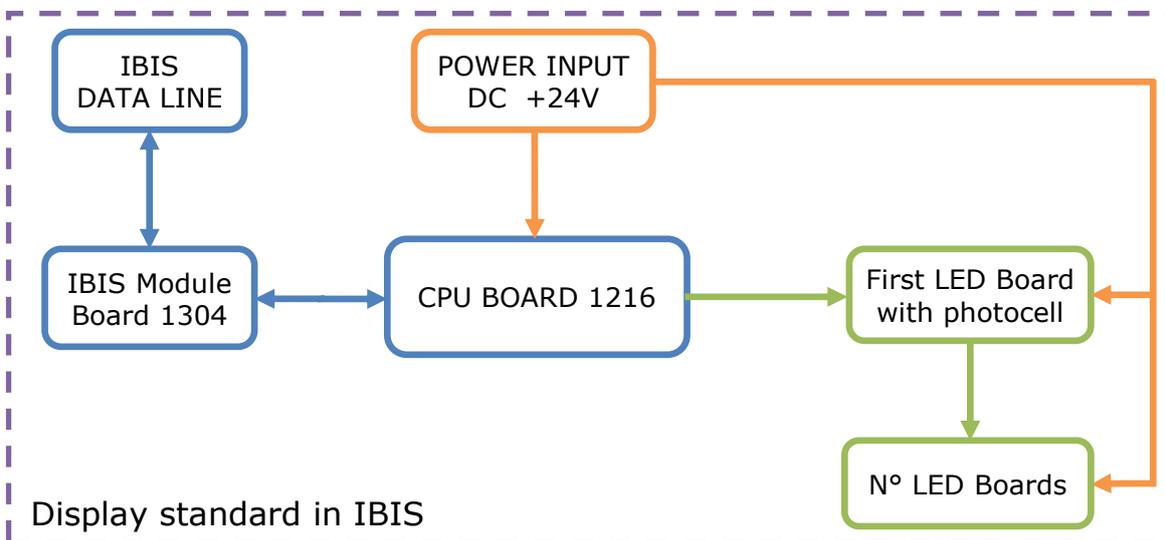
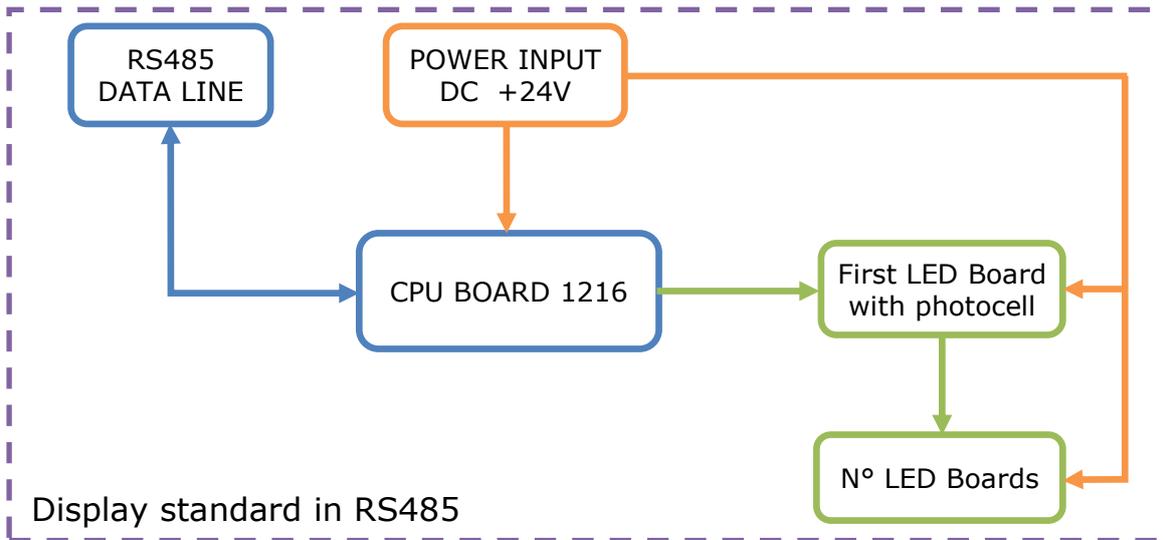
It is normally driven by an on-board computer equipped with SW management, with which it communicates via appropriate communication system.

Although these displays are designed and fabricated by using best technologies to ensure max reliability and durability, yet above mentioned stresses for long period of time can lead to malfunctioning and failures of the same, whose preventive and corrective maintenance procedure will be described in *chapter 6 "PREVENTIVE MAINTENANCE"; and chapter 7 "DIAGNOSTIC "*.



Note: any use other than that is indicated, or any specification/protocol other than that is described in this manual, or any installation which does not observe the instructions provided herein, is improper: any resulting malfunctions cannot be attributed to Aesys.

3.3 Functional Block Diagram



4. TECHNICAL SPECIFICATIONS

This chapter describes the mechanical, electrical and electronic characteristics of these displays. In detail, it includes the characteristics of the matrix and related components, from the optical and the dimensional point of view. Please read these informations carefully before using, servicing or working on these VMS.

4.1 General characteristics of all models of the Series Minerva

General characteristics	
Product :	Series Minerva monochromatic
Conformity :	UN ECE R10 – R118 SAE J1113-1 SAE J1113-11
Version :	Single sided
Installation :	On-board, ceiling installation

The VMS of series Minerva have a full type monochromatic matrix with white or amber colored LED.

The system is based upon the use of an industrial CPU that allows you to drive alphanumeric/graphics information on to the LED matrix of VMS.

These VMS communicate via serial according to a specific protocol of data transmission.

4.2 Mechanical characteristics of all models of the Series Minerva

Mechanical characteristics	
Case :	Aluminium, with matte black epoxy polyester paint panel.
Fixing to the support :	Through the 4 rivet nuts mounting dowels and safety bolts.
Internal access :	Open the whole rear side to access the internal components.

4.2.1 Housing

These VMS have been designed by taking into account the mode of installation, environmental conditions, and ease of maintenance. The components have been positioned and laid out in a manner to facilitate the maintenance process; even the unified & standard tools of minimum numbers are required for the maintenance process.

The load-bearing structure is formed by four aluminum extruded profiles, which are fixed together to give a certain structural strength to the container.

These displays are powder-coated with polyester polymerized paint in the range of RAL color.

4.2.2 Mounting configuration

On both of the lateral heads of VMS, four female inserts (two on each side) are fitted to fix them onto the supporting structure by means of four M8 bolts (see *para.* 5.2 “**Installation**”).

4.2.3 Front Screen

The front part of these VMS consists of masks which are made with thermoplastic material. Behind these masks, the LED modules are mounted.

These masks are designed to prevent direct sun light onto the LED boards and also to improve the contrast ratio of the display.

4.2.4 Access to the internal components

The whole rear side of the VMS is closed with a back cover and self-tapping screws.

The CPU board is fixed to this back cover using M3 pin inserts, while the LED boards are mounted in front of the display with self-tapping screws directly onto extruded profiles.

4.3 Environmental characteristics of all models of the Series Minerva

Environmental characteristics	
Degrees of protection :	IP30
Operating temperature :	-20° C ÷ +65° C
Operating humidity :	10% ÷ 90%
Cooling system :	Not present.
Heating system :	Not present.

Given the constant presence of aggressive agents such as saline mist and greasy dust, the materials used for the container, for the screen and for the external screws were selected to be stainless (rust-resistant), long-life (especially the polyester epoxy paint) and mechanically resistant.

4.4 Electrical Characteristics of all models of the Series Minerva

Electrical characteristics	
Input power supply voltage :	Nominale 24VDC Range 16 ÷ 32 VDC, Code F (<i>referring to ISO16750-2</i>)
Protections :	Polarity Inversion , Overload Surge / Burst suppressor

4.4.1 Internal Cabling

The internal cabling of the powered components is done with conducting wires. The supply of medium-voltage 24Vdc is done by using conducting wires of section 1.5 mm² (minimum).

For the low voltage contacts, the conducting wires of different sections running towards the various electronic boards are used:

(LED board power)

+24 VDC (+ LED) = RED

0 VDC = BLACK of polarized connectors

For controlling the signals, the connections between CPU board and LED boards are made with flat cables and polarized connectors.

4.5 Electronic characteristics of all models of the Series Minerva

Electronic characteristics	
CPU :	“Type 1216 CPU board”
Total number of CPU :	1
Diagnostics :	The on-board panel controller is able to detect and transmit, via RS485/232 or IBIS, to the host some panel anomaly, according to the protocol.
Brightness sensor :	Front integrated in a LED board.
Data communication :	RS485/232, IBIS.

The VMS is equipped with a CPU of Aesys “Type 1216”. This CPU allows you to connect with the on-board Computer and manages the informations to be displayed on the matrix.

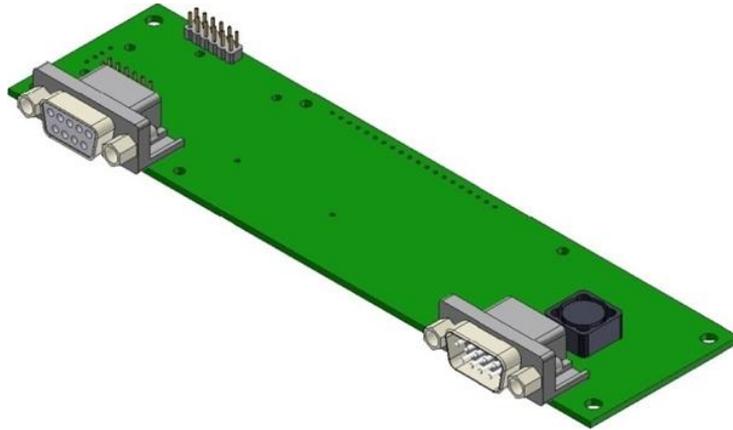


Figure 4-1: CPU Board "Type 1216" (cod. 140031713)

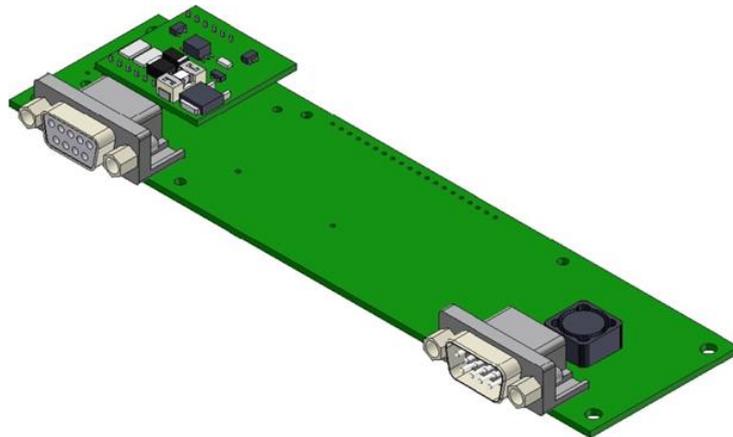


Figure 4-2: CPU Board "Type 1216" (cod. 140031713) with expansion IBIS type "1304" (code 140031677) for IBIS displays

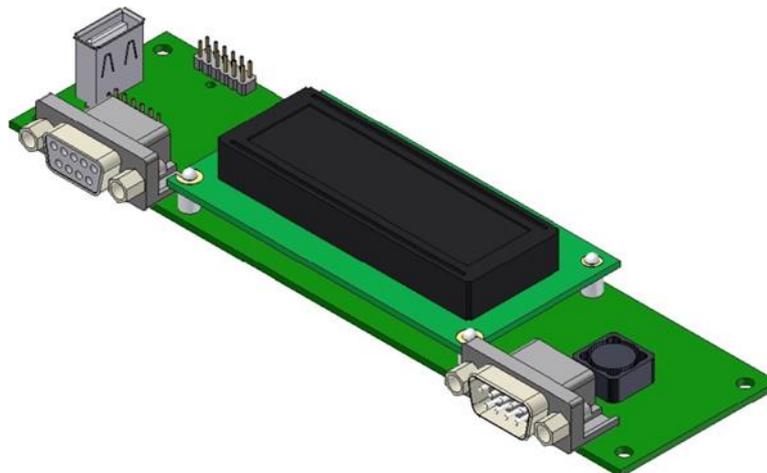


Figure 4-3: CPU board "Type 1216" (cod. 140031621) for the display with Embedded DC600

The VMS is also equipped with some other electronic boards having specific functions; please refer to the *chapter 8 "MAIN COMPONENTS"* and *10 "ENCLOSURES"* for more information on these cards.

4.6 Matrix characteristics of all models of the Series Minerva

Monochromatic full-matrix section		
Matrix type :	Full-matrix.	
Available pictograms :	Variable according to the programming.	
Rows / character available :	It depends on character height and type, and space among rows and characters.	
Colours set :	Monochromatic amber.	Monochromatic white.
Colours :	Amber 590nm \pm 4nm	White CCT 6000K \pm 300K
Luminance :	Amber 5000 cd/ m ²	White 10000 cd/ m ²
LEDs per pixel :	1 (Y)	1 (W)
X-axis Viewing Angle :	120° Brightness >50%	
Y-axis Viewing Angle :	120° Brightness >50%	
Brightness control :	16 levels, automatic or manual.	
LEDs type :	SMD	
LEDs control :	Static LED control system with power flow regulation.	

4.7 CE nameplate

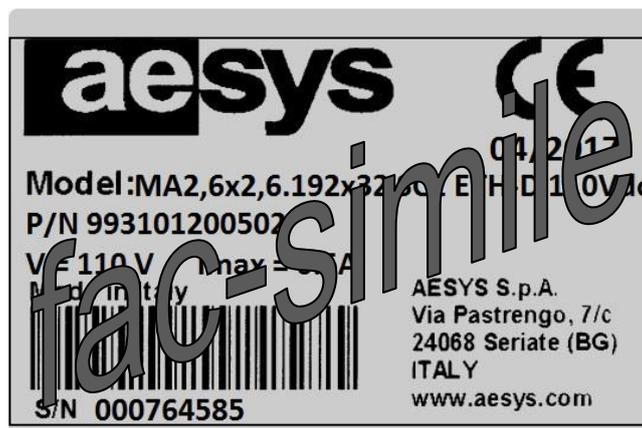


Figure 4-4: facsimile of CE nameplate



Note: make sure that the CE nameplate is present on the product. It shows the serial number that helps us in identifying the uniqueness of the VMS, in case of ordering the spare parts.

4.8 Model MA/MW 408x512 20px

Mechanical characteristics			
Dimensions (W x H x D) :	1.790 x 315 x 45 mm.	1.690 x 315 x 45 mm.	445 x 315 x 45 mm.
Weight :	~ 6,5 Kg.	~ 6 Kg.	~ 2,5 Kg.

Matrix sections			
Pitch :	10.36 x 13 mm. (W and H).		
LED boards models :	<ul style="list-style-type: none"> • "Type 1416 (MA/MW408x512 40x20/1 Y/W)" board. • "Type 1418 (MA/MW408x512 10x20/1 Y/W)" board. 		
Pixels (W x H) :	170 x 20	160 x 20	40 x 20
Total number of pixels :	3.400	3.200	800
Total number of LED boards :	4 (1416) + 1 (1418)	4 (1416)	1 (1416)

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 1)

4.9 Model MA/MW 400x500 16px

Mechanical characteristics				
Dimensions (W x H x D) :	1.650 x 250 x 45 mm.	1.250 x 250 x 45 mm.	845 x 250 x 45 mm.	500 x 250 x 45 mm.
Weight :	~ 6 Kg.	~ 5 Kg.	~ 3 Kg.	~ 2 Kg.

Matrix sections				
Pitch :	10.16 x 12.7 mm. (W and H).			
LED boards models :	"Type 1429 (MA/MW400x500 40x16/1 Y/W)" board.			
Pixels (W x H) :	160 x 16	120 x 16	80 x 16	40 x 16
Total number of pixels :	2.560	1.920	1.280	640
Total number of LED boards :	4	3	2	1

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 2).

4.10 Model MA/MW 400x400 8PX

Mechanical characteristics	
Dimensions (W x H x D) :	1.007 x 140 x 45 mm.
Weight :	~ 2.5 Kg.

Matrix sections	
Pitch :	10.16 x 10.16 mm. (W and H).
LED boards models :	"Type 1515 (MA/MW400 48x8/1 Y/W)" board.
Pixels (W x H) :	96 x 8
Total number of pixels :	768
Total number of LED boards :	2

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 3).

4.11 Model MA/MW 350x400 24px

Mechanical characteristics			
Dimensions (W x H x D) :	1.800 x 300 x 45 mm.	1.450 x 300 x 45 mm.	380 x 300 x 45 mm.
Weight :	~ 6 Kg.	~ 5 Kg.	~ 2 Kg.

Matrix sections			
Pitch :	8.89 x 10.16 mm. (W and H).		
LED boards models :	"Type 1426 (MA/MW350x400 40x24/1 Y/W)" board.		
Pixels (W x H) :	200 x 24	160 x 24	40 x 24
Total number of pixels :	4.800	3.840	960
Total number of LED boards :	5	4	1

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 4).

4.12 Model MA/MW 375 16px

Mechanical characteristics				
Dimensions (W x H x D) :	1.550 x 205 x 45 mm.	1.170 x 205 x 45 mm.	800 x 205 x 45 mm.	420 x 205 x 45 mm.
Weight :	~ 4.5 Kg.	~ 4 Kg.	~ 3 Kg.	~ 2 Kg.

Matrix sections				
Pitch :	9.525 mm. (W and H).			
LED boards models :	"Type 1321 (M375 40x16/1 Y/W)" board.			
Pixels (W x H) :	160 x 16	120 x 16	80 x 16	40 x 16
Total number of pixels :	2.560	1.920	1.280	640
Total number of LED boards :	4	3	2	1

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 5).

4.13 Model MA/MW 300x375 16px

Mechanical characteristics		
Dimensions (W x H x D) :	1.250 x 205 x 45 mm.	950 x 205 x 45 mm.
Weight :	~ 3.5 Kg.	~ 3 Kg.

Matrix sections		
Pitch :	7.62 x 9.525 mm. (W and H).	
LED boards models :	"Type 1322 (MA/MW300x375 40x16/1 Y/W)" board.	
Pixels (W x H) :	160 x 16	120 x 16
Total number of pixels :	2.560	1.920
Total number of LED boards :	4	3

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 6).

4.14 Model MA/MW 275x342 20px

Mechanical characteristics	
Dimensions (W x H x D) :	1.150 x 228 x 45 mm.
Weight :	~ 4 Kg.

Matrix sections	
Pitch :	7 x 8.7 mm. (W and H).
LED boards models :	"Type 1419 (MA/MW275x342 40x20/1 Y/W)" board.
Pixels (W x H) :	160 x 20
Total number of pixels :	3.200
Total number of LED boards :	4

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 7).

4.15 Model MA/MW 300x300 24px

Mechanical characteristics		
Dimensions (W x H x D) :	1.250 x 235 x 45 mm.	950 x 235 x 45 mm.
Weight :	~ 4.5 Kg.	~ 3.5 Kg.

Matrix sections		
Pitch :	7.62 mm. (W and H).	
LED boards models :	"Type 1436 (MA/MW300 40x24/1 Y/W)" board.	
Pixels (W x H) :	160 x 24	120 x 24
Total number of pixels :	3.840	2.880
Total number of LED boards :	4	3

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 8).

4.16 Model MA/MW 300x300 16px

Mechanical characteristics				
Dimensions (W x H x D) :	1.250 x 150 x 45 mm.	950 x 150 x 45 mm.	650 x 150 x 45 mm.	340 x 150 x 45 mm.
Weight :	~ 3 Kg.	~ 2.5 Kg.	~ 2 Kg.	~ 1 Kg.

Matrix sections				
Pitch :	7.62 mm. (W and H).			
LED boards models :	"Type 1431 (MA/MW300 40x16/1 Y/W)" board.			
Pixels (W x H) :	160 x 16	120 x 16	80 x 16	40 x 16
Total number of pixels :	2.560	1.920	1.280	640
Total number of LED boards :	4	3	2	1

For more information about these VMS please refer to the documents attached to this manual. (See enclosure No. 9).

5. TRANSPORT, INSTALLATION AND COMMISSIONING

These VMS have been designed for indoor use, and to be mounted through suitable supports. They may not be used in the vicinity of high concentrations of dust, gaseous explosives or fluids.

Aesys reserves the right to modify the transport, installation and commissioning specifications at any time according to its own discretion.



Caution: when unpacking, installing and activating these VMS, appropriate PPE must be worn.

5.1 Transport and storage

The VMS has to be transported, especially by road, with suitable supports and packaging to protect it against impacts, violent acceleration and vibrations. Note that such repeated actions/stresses during the transportation may damage the electrical and electronic systems of the panel and seriously compromise its operation. (In whole or in parts)

During the transport and storage, keep the VMS under cover, in a clean area, preferably under shelter to protect it from the rainfall.



Note: The VMS must always be held vertically: this reduces the risk of entering the rain, snow, dust etc. into it.

5.2 Installation



Note: Before installing the VMS on its support, inspect it thoroughly to ensure that it is in good condition and undamaged during transportation and storage.

The VMS must be positioned on an adequate support that is capable of bearing its weight and any other agent (due to wind & snow) which may insist on it.

This support must be designed to hook the VMS using appropriate lateral predispositions and with the help of M8 bolts.



Note: when positioning the VMS on its support, it is essential to consider its dimensions and clearances, and respect their alignment, perpendicularity and flatness. A dimensional drawing is enclosed with this manual for the help.

Once the VMS has been positioned and secured to its support, the electrical and data connections must be made in accordance with the diagrams enclosed with this manual (see *Enclosure n. 2*).



Caution: the power and data connections must be done by a qualified electrician.

Once the installation is completed, clean off any dust, grease or other material that is hampering the good view of the LED matrix of VMS. Use chemically non-aggressive cleaning materials, taking extra care to avoid damaging the front of the panel (see *para. 6.1 "Interna"*).

5.3 Activation and commissioning

Next to the installation and completion of the electrical & data hookup, the VMS must be activated by switching it on from the electric control board.

On giving the power, wait for a few seconds as CPU takes some time to reset all its functions. Once the CPU restores its functions, the operation of VMS is highlighted with the display of a point (or a group of pixels) at the right side bottom of the matrix.

The VMS is configured with a series of operating parameters, which determine its operation in normal conditions. These parameters are as follows:

- **Forced Brightness level:** The VMS maintains the brightness of the LEDs at a fixed value;
- **Automatic Brightness:** In this mode, the VMS adjusts its brightness autonomously as per the ambient light;
- **Time-out:** the VMS turns off autonomously if the communication with the local central control unit or with the Host is lost for a time greater than the predetermined value.

From the Host, it is possible at any time, to send the messages to be displayed on this active VMS and set other parameters.



Note: in case, after the activation of the data connections, if display shows two points at the right bottom of the matrix, then please check if the data cable is connected properly and the server is communicating successfully with panel.

On launching a message, if the panel malfunctions then please refer to the *chapter 7 "DIAGNOSTIC "*.

5.4 Activity log

Next to the activation of VMS, it is recommended for the users to maintain a record or fill in an "Activity log" (paper or electronic) specifically for each panel, in order to track:

- the model of the VMS, with its product code and serial number (deduced from the CE nameplate);
- the dates of installation, activation, testing and any other event;
- the details of any preventive maintenance work, along with date and result;
- the details of any corrective maintenance work, along with date, result and replaced spare parts (with the corresponding serial number – if present);
- Any significant event or element of risk which requires a future evaluation.



Note: after finishing the installation activities, the owner of the VMS must run preventive maintenance as described in *chapter 6 "PREVENTIVE MAINTENANCE"*; otherwise the warranty is declared void.

6. PREVENTIVE MAINTENANCE

Aesys VMS are designed to have simple maintenance processes, both scheduled (preventive) and occasional (corrective) maintenance, and in order to achieve that some of the following criteria have been adopted:

- mechanical structure composed of materials with highly resistance to aggressive agents and vibration;
- electronic components with high MTBF;
- high quality, reliable cabling;
- static LED control;
- firmware with integrated diagnostics;
- modular boards;
- highly integrated functions;
- Minimal number of optimized electrical and mechanical components.

It means that Aesys VMS has outstanding reliability and long service life. However, to ensure proper operation and to increase the product's service life it is important, at regular intervals, to run preventive maintenance as described below.



Note: the Preventive Maintenance is considered compulsory for the owner of the panel, otherwise the warranty is declared void.



Caution: when servicing the VMS, appropriate PPE must be worn.

Some of the activities that need to be performed periodically are as follows.

6.1 Internal and external cleaning

Being placed in generally very aggressive environments and due to exposure to the atmospheric agents, the accumulation of dust and other debris over and inside the VMS can possibly be take place, which may seriously affect its performance. Therefore the regular cleaning of the VMS externally as well as internally, beyond the aesthetic factor, is very much necessary to maintain its good efficiency.

The external cleaning should be done every two years, particularly at the active area of the matrix and in front of the photo-sensor. The cleaning products should be non-abrasive to prevent any damage to the anti-reflective layer of the front and any liquid penetration into the container should be avoided.

While for the internal cleaning of the VMS (recommended once a year), it is best to use low pressure compressed air jets and avoid liquid cleaners. Extra attention has to be paid at the areas of accumulation. It is also recommended to check the condition of all electrical and electronic components during the periodic cleaning process.

6.2 Housing of the Panel

The internal and external metallic structure of the housing of VMS should be checked periodically every year for any evidence of deterioration, especially at the welded joints. The conditions of stability of the various metallic structures and their state of preservation for the purposes of maintaining the efficiency should always be ascertained.

The periodical inspection should have the following objectives:

- Highlight the evidence of degradation;
- follow the evolution of maintenance needs over time;
- provide data that can contribute to the elaboration of projects or adjustments in the future.

6.3 Maintenance report

The preventive maintenance is considered completed only after filling in a specific report that has to be kept with the technical documentation of the VMS. (See *para 5.4*)



Note: if you need to replace a component, please refer to the chapter 7 *DIAGNOSTIC* ".

7. DIAGNOSTIC AND CORRECTIVE MAINTENANCE (TROUBLESHOOTING)

This chapter provides the information required to diagnose and troubleshoot any faults or failures in the operation of the VMS.

The knowledge of informations described in the previous chapters will be a great help for the process of troubleshooting. At most of the cases the faults and other technical issues are easy to resolve.



Note: Any activity performed during the warranty period of the VMS (with the exception of the “Preventive Maintenance” that is described in *Chapter 6*) immediately voids the warranty itself, unless it is expressly agreed with Aesys.

7.1 Aesys Customer Service for technical assistance

In the event of requesting for technical assistance/repair, the user must prepare firstly the following data:

- Product code and serial number of the panel, inferable from the CE nameplate (see the *para 4.7 “CE ”*);
- if possible, a copy or the references of the Aesys delivery note;
- description of the problem;
- Any other relevant information to better identify the problem.

Then contact the *Aesys Customer Service* as follows:

- **www:** visit www.aesys.com, click on the “SERVICE” section and follow the instructions.

Only if you may not contact the Aesys Customer Service via the above link, use the following references:

- **Email:** service@aesys.com.
- **TEL:** +39 035 29 240 → EXTENSION 9, during the company’s opening hours.



Note: A fee will be added to any out of warranty phone/email technical assistance.

7.2 Switching the sign OFF and ON again

The VMS must be switched off when it is required to operate inside it without power, for example general inspections or corrective maintenance. To do so, simply disconnect the main power supply from the external electric panel board.

On the completion of the activity, the VMS needs to be reactivated. For which we can reconnect the main power supply from the same external electric panel board.

After connecting to the main power supply, wait a few seconds for the CPU to reset all its functions.



Caution: if you shut off the main power to the VMS, make absolutely sure to check all the connections before powering it up again, especially during maintenance.

7.3 Replacing components

All electrical and electronic components are modular parts which are mounted mechanically to their relative mounting plates with the help of threaded inserts (integral part of mounting plates), spacers if necessary with insulating material, and M3 and M4 locknuts.

To replace the parts like electronic boards, AC/DC power supply etc. simply use a 5.5mm or 7mm hex pipe wrench.

The electrical connections of all the electronic boards are made with removable polarized connectors; make sure that all these connectors are disconnected before pulling the board out.



Caution: malfunctioning or faulty parts may only be replaced with the equipment powered off, and by properly trained technical staff.

While removing any faulty components or during general maintenance, it is necessary to follow the procedure as given below:

- Shut off the main power to the VMS as described in *para. 7.3*.
- disconnect the electrical connector on the faulty device;
- unscrew the locknuts/bolts of the faulty component; use a 5.5mm hex pipe wrench for LED electronic board or 7.7 mm hex pipe wrench for AC/DC power supply;

- replace the part and restore the locknuts/bolts and made the electrical connections;
- Restore the power and test for the right operation of the new device.

Important: while replacing the components, tight the fasteners as per the tightening torque indicated on the original or replaced item.



Note: do not use non-original spare parts or parts not supplied by Aesys: using incorrect spare parts not only voids the warranty, but reduces the panel's performance and service life, as well as being hazardous for its users.



Note: consult the local industrial waste disposal regulations in the country of use when scrapping the removed faulty parts.

All power cables are connected at the terminal of the equipment and identified by color:

- Red = +24 VDC
- Black = 0 VDC

7.4 Troubleshooting

Here below are present some information that may be helpful to identify and solve the various technical problems. But before operating on the VMS, please read the *para Errore. L'origine riferimento non è stata trovata.* “**Errore. L'origine riferimento non è stata trovata.**” carefully.



Note: when replacing faulty electronic boards, always check the dip-switch settings and replicate them on the new unit.

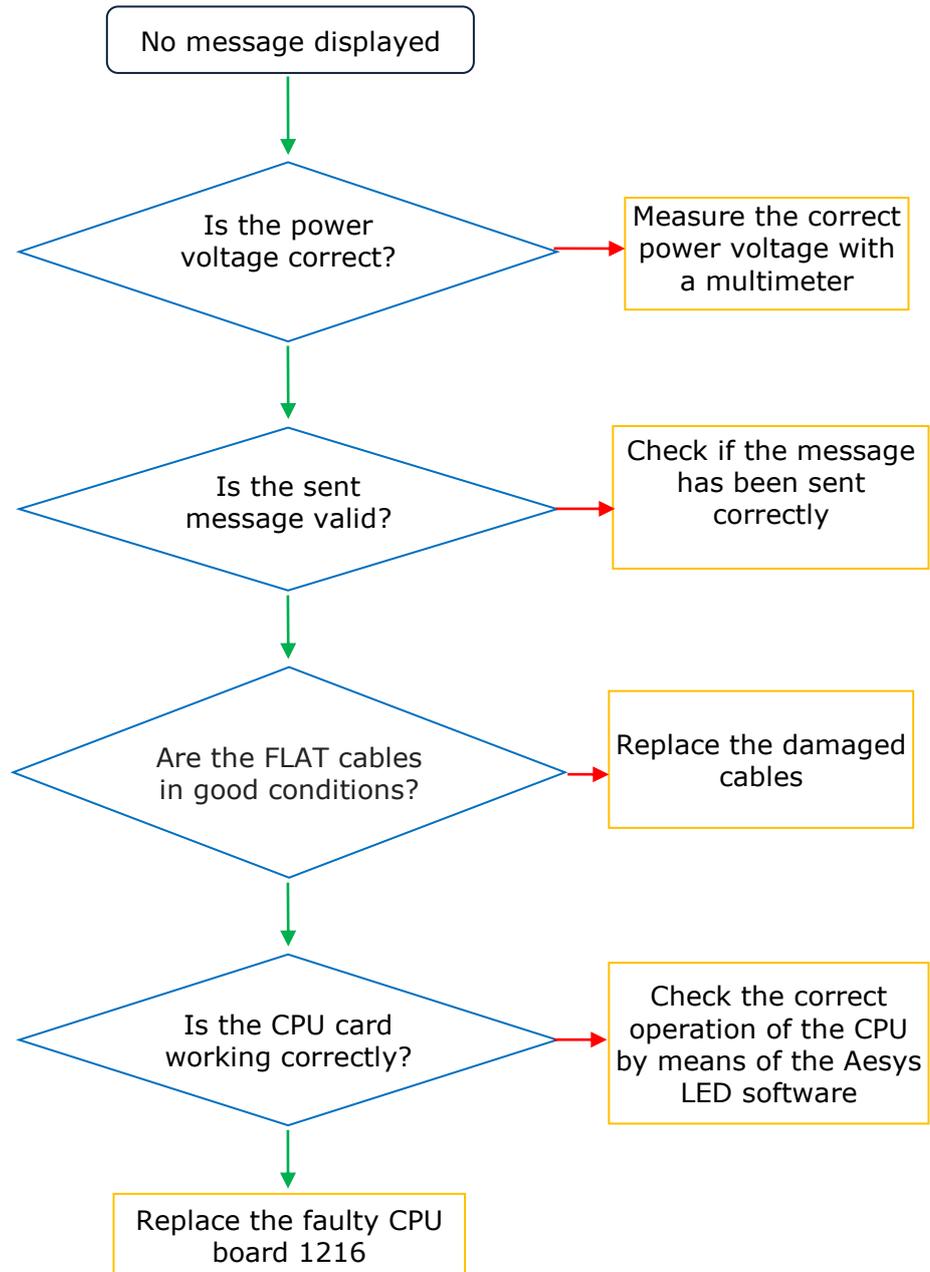
7.4.1 Damages of the housing

The VMS should be inspected after each major event like severe weather, road accidents, landslides, and earthquakes because the situation may demand to make any adjustment in the Law as well as in the device itself.

During any vigorous activity of replacing damaged parts such as bolting, welding etc. special attention has to be paid in order the restore the original and actual working condition of the panel. The panel must work smoothly and effectively after any intervention.

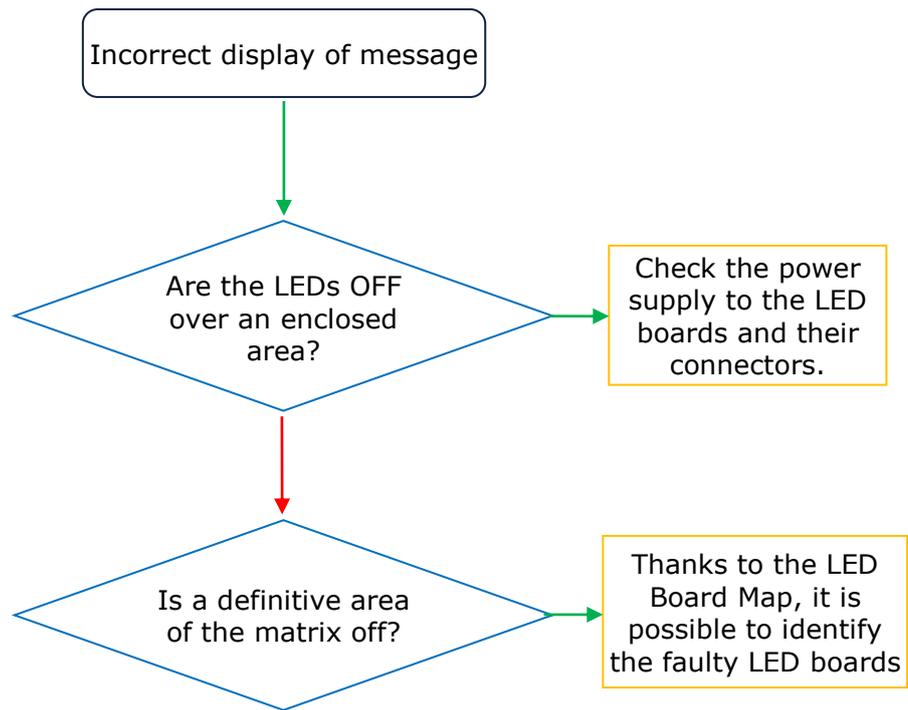
7.4.2 No Message Displayed

After activating a VMS, if no message is being displayed at the LED matrix, then after reading the *para 7.3* **Errore. L'origine riferimento non è stata trovata.** "Replacing components" *proceed* as follows;



7.4.3 Partial or incorrect display of message

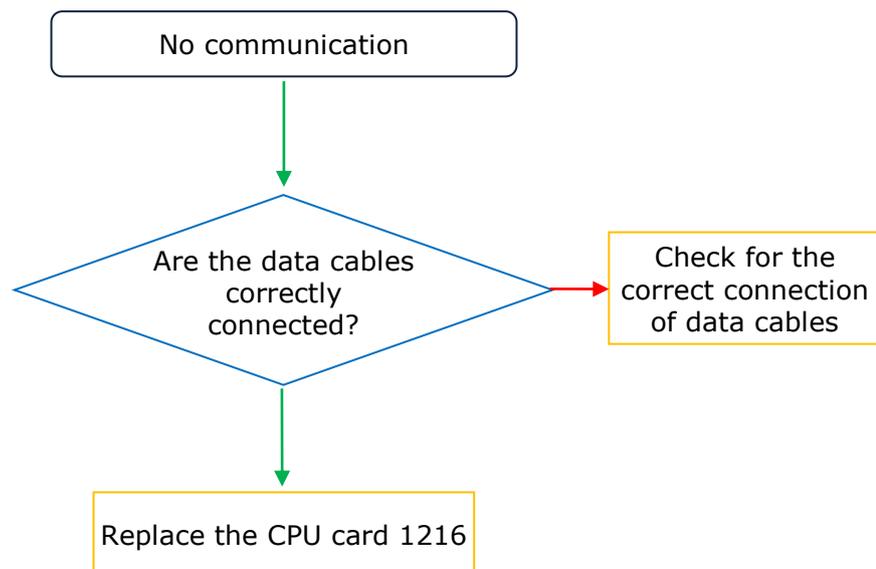
If the VMS is working, but the messages are being displayed only in parts or incorrectly; then proceed as follows:



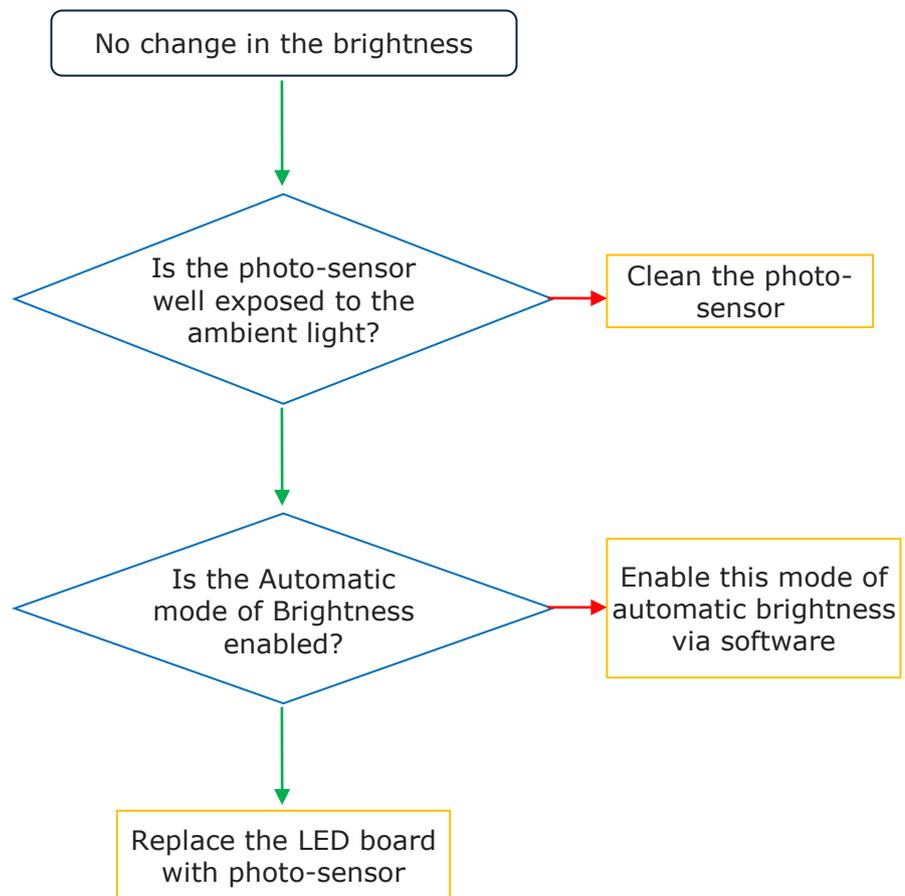
7.4.4 Other problems

If the messages are being displayed correctly, but VMS shows other malfunctions; then proceed as follows:

- Non functional communication with the On-Board Computer



- Failure of the matrix brightness variation



7.5 Maintenance report

The corrective maintenance is considered completed only after filling in a specific report that has to be kept with the technical documentation of the Display (see *para* 5.4 "Acti").

8. MAIN COMPONENTS

For the main components of the VMS of series Minerva monochromatic, please refer to the documents attached to this manual.

8.1 Identifying spare parts

Each component of the panel (boards, wiring, etc ...) can be identified through a label or a sticker which is actually pasted or printed on these components. This label carries the information like “Aesys code” and any code of Release: see for example *Figure 8-1* & the *Figure 8-2*.

This combination of Aesys Code and Code of Release (example: 140031493-D) allow the users to identify the uniqueness of the component.

Please refer to the paragraph *para Errore. L'origine riferimento non è stata trovata.* “*Errore. L'origine riferimento non è stata trovata.*” to see the list of the main components.



Note: when ordering the spare parts to *Aesys Customer Service*, always specify this combination of Aesys Code and Release (if present).

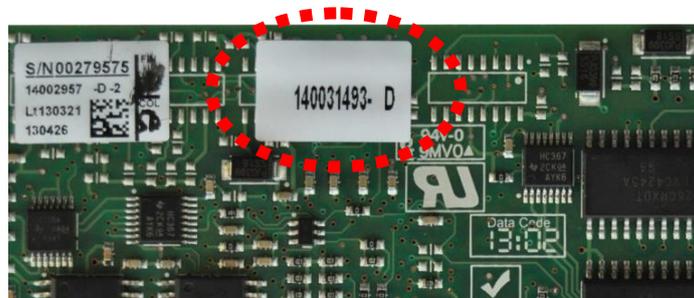


Figure 8-1: facsimile of an identifying label with code and release applied on an electronic board



Figure 8-2: example of code and release imprinted on a wiring cable

9. WARRANTY

For the warranty of this product, we refer expressly to the article 1490 of the Italian Civil Code. The warranty period lasts for 12 months that starts from the date of delivery of the product to the client, and it is considered to be ex-works, Seriate (BG).

Aesys's responsibility is limited up to the free of charge repair or replacement of the parts with manufacturing and material defects, and does not include replacement of the entire product itself.

The warranty also does not cover the following:

- Repair of damage caused by accidents, negligence, or improper use;
- Repair of damage caused by atmospheric events (rain, fire, lightning strikes, etc.);
- Repair of the product that is damaged or defective due to repairs performed by non-qualified persons or persons not authorized by aesys;
- Repair of products damaged by tampering, vandalism, transformation or unsuitable connection to electrical equipment.

The client must cite and report the defects no later than 8 days after the date of their discovery by using the references indicated in *para 1.3* "Manufacturer's identifying data".

The warranty service will be provided after the inspection done by aesys itself on the reported component/device.

The client agrees to bear all costs of work done by Aesys technicians at any site other than the Aesys factory, even during the warranty period. The client is not required to bear the costs of the defective replaced material.



Note: preventive maintenance activity (Chapter 6) is considered mandatory for the owner of the Panel, and ignoring it will void the warranty.



Note: any work done on the panel during the warranty period (with the exception of the "Preventive Maintenance" activities described in Chapter 6) immediately voids the warranty itself, unless expressly agreed with Aesys.



Note: do not use non-original spare parts or parts not supplied by Aesys: using incorrect spare parts not only voids the warranty, but reduces the performance and service life of the panel, as well as it becomes hazardous for its users.

10. ENCLOSURES

List of files attached to this manual:

- Enclosure # 1: family MA/MW 408x512 20 pixel
- Enclosure # 2: family MA/MW 400x500 16 pixel
- Enclosure # 3: family MA/MW 400x400 8 pixel
- Enclosure # 4: family MA/MW 350x400 24 pixel
- Enclosure # 5: family MA/MW 375x375 16 pixel
- Enclosure # 6: family MA/MW 300x375 16 pixel
- Enclosure # 7: family MA/MW 275x342 20 pixel
- Enclosure # 8: family MA/MW 300x300 24 pixel
- Enclosure # 9: family MA/MW 300x300 16 pixel



Note: all the enclosures listed above are an integral part of this document.
