
USER AND MAINTENANCE MANUAL



DIN CONTROLLER DC600

993301300200 *DIN CONTROLLER RS485*
993301300201 *DIN CONTROLLER IBIS MASTER*
993301300202 *DIN CONTROLLER IBIS SLAVE*



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1. INTRODUCTION

The **DC600** Central Control Unit (CCU) is the Aesys on-board controller device. Its primary function is to transmit messages and/or destinations to the destination sign system. It is responsible for the management of all communications with associated signs and provides a user-friendly interface.



Fig.1.1 — DC600 Central Control Unit

Functionally, it is the on-board device for selecting the line code number and/or the destination location. Once selection has been made using the <Enter> key, the CCU will start to transmit sending the destination information to the LED destination sign. The CCU also monitors system operation and provides the user with important diagnostic information.

The operator can use the CCU's LCD to verify that the destination message or code number selected with the keyboard is the one he wishes to display, before sending the command to actually display the message. It is also used in maintenance procedures and to verify and update internal operating firmware.

It is also used for troubleshooting.

Basic components of the user interface include an alphanumeric keyboard, to select functions, and an LCD display to receive confirmation of performed operations.

The **DC600** is normally supplied complete with operational firmware and a customer database containing the information to be displayed on the signs. Both functional firmware and customer database information can be updated using a USB flash drive. A special USB receptacle for reading the flash drive is located in the left side of the CCU's front panel.

1.1 DC600 Central Control Unit (CCU) Features

The major controls on the DC600 CCU are detailed below in Fig.1.2. A brief description of special keys and functions are described below in Fig. 1.2.

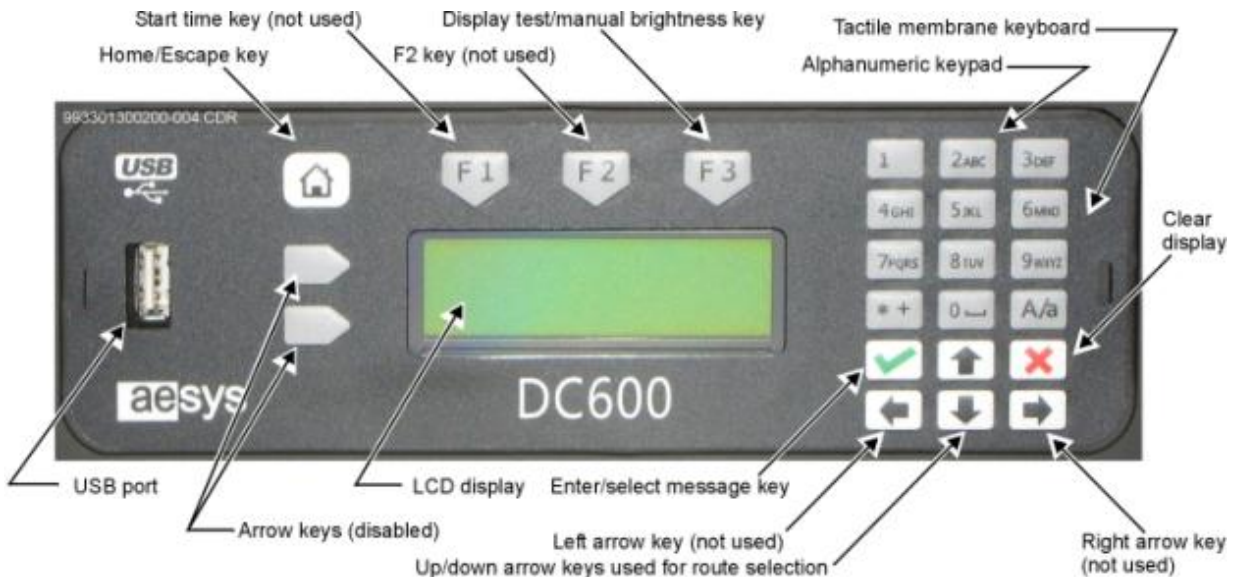


Fig.1.2 — DC600 Central Control Unit, Selected Features

Key Name	Key Image	Description
F1		The F1 Key is the Start Time key (not used).
F2		F2 Key (not used).
F3		The F3 Key is used for the Display Test/Manual Brightness Option.
Clear Display		The Clear Display Key is used to clear the display and make the sign blank.
Enter/Select		The Enter/Select is used to Enter or Select Message.
Up Arrow		Up Arrow Key is used to Select Messages/Counting Down, 1>9.
Down Arrow		The Down Arrow Key is used to Select Messages/Counting Up, 9>1.
Home		The Home Key is used to escape from the previous screen.

Tab. 1 – Explanation of Special Keys and Functions

2. DIMENSIONS

The dimensions of the control unit are shown below in *Fig. 2.1*.
Its weight is **0.66 kg**.

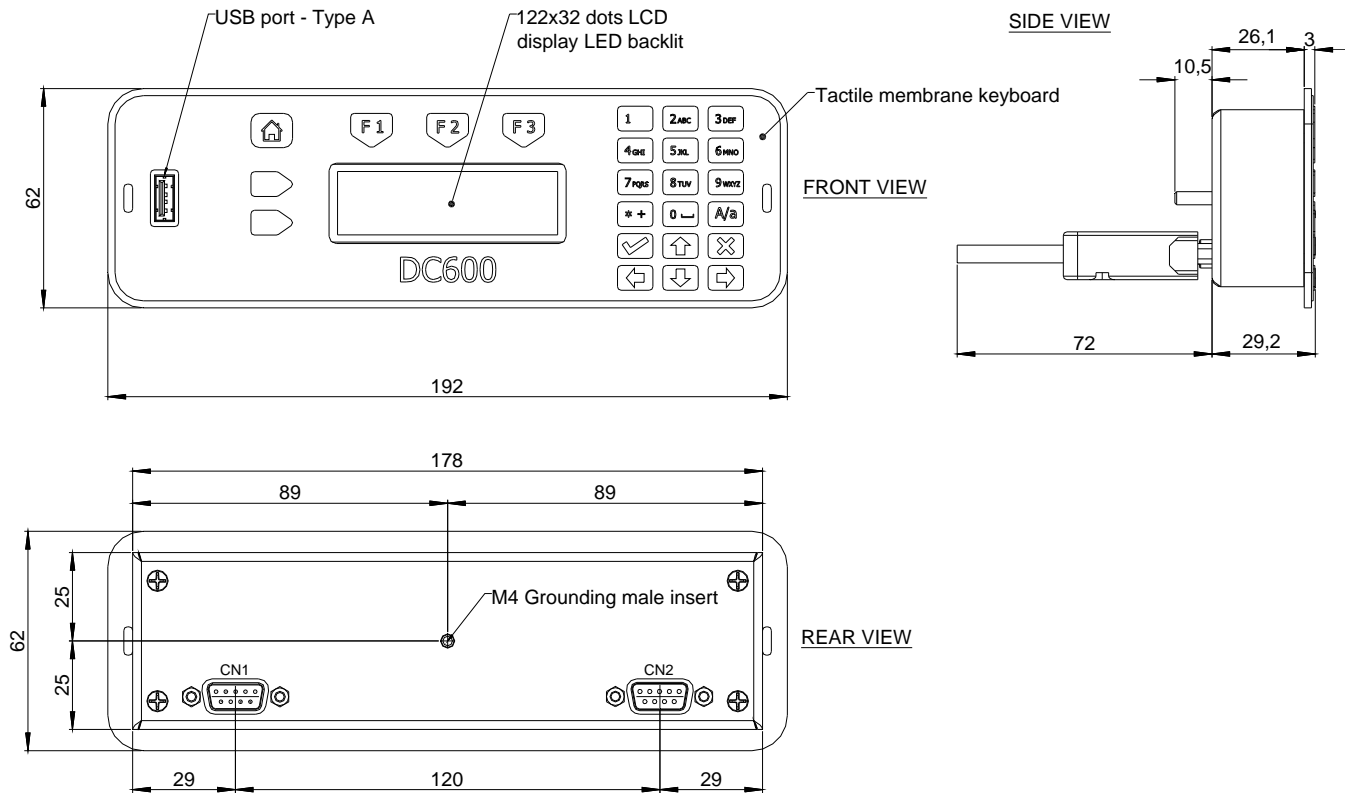


Fig. 2.1 – Dimensions

3. SAFETY CRITERIA

The design and construction of the DC600 employ the criteria and measures required to satisfy the essential requisites of the following directives:

- **Directive 2006/95/EC** on the harmonization of the laws of Member States relating to electrical equipment for use within certain voltage limits
- **Directive 2004/108/EC** on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC



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.

3.1 General instructions

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

Operators working on the 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 sign, 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 himself or others.

The operation of the devices and safety equipment must be checked from time to time, and any malfunctions thereof reported immediately to the supervisor to enable the equipment to be restored to its normal safe and reliable operation.



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



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

3.2. Suitability of operators and maintenance staff

Operators charged with using the sign must be at least 18 years old and recognized by the owner of the VMS as psychologically and physically fit to fulfill their responsibilities.



Note: the purchaser and user of the sign must train his staff charged with operating and servicing the sign and its safety equipment in their responsibilities.



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

Aesys may agree to provide supplementary instruction by having the user's operators supervised by the manufacturer's technical staff. Such services will be agreed during the stipulation of a separate contract. Operators are classified according to their responsibilities as follows.

3.2.1 User

Definition: a person charged with sending messages to the sign from a PC (Personal Computer) located in a Remote Operations Centre:

- he must be instructed in the use of the software connecting to the sign by training or initial supervision;
- he is not authorized to work on the VMS's electrical or mechanical equipment.

3.2.2 Mechanic

Definition: a person charged with doing mechanical maintenance, adjustments, replacements and repairs:

- a skilled mechanic, able to service mechanical assemblies safely and satisfactorily, due to his theoretical training and practical experience;
- he is not authorized to work on the VMS's electrical equipment.

3.2.3 Electrician

Definition: a person charged with doing electrical/electronic maintenance, adjustments, replacements and repairs:

- a skilled electrician/electronic technician, able to service electrical and electronic systems safely and satisfactorily, due to his theoretical training and practical experience;
- he is not authorized to work on the VMS's mechanical equipment.

3.3 Safety instructions and standards

Observing safety standards enables the operator to work effectively and confidently, without the risk of injury to himself or others. In particular:

- make sure to shut off power (with the automatic circuit breakers) when doing maintenance, replacements or repairs of electrical equipment;
- make sure that the sign is installed on a mount suited to its conditions of use and any existing hazards (tampering, vibration, etc.), verified by structural calculations complying with established regulations;
- provide adequate lighting when working on the sign. The lighting system contained in the sign (if any) may be used for this purpose.



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

During normal use, the following instructions must be observed:

- observe the maintenance and technical service procedures;
- log the dates and results of regular inspections;
- never use petrol, solvents or other flammable fluids to clean the sign;
- use eyeglasses with side guards when using compressed air (whether supplied by a canister or compressor) for cleaning, and limit the pressure to the strictly necessary value;
- never use open flames as lights;
- make sure that all live sections of the electrical equipment are in good working condition.



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

3.4 Scrapping

The sign is designed with criteria of efficiency and eco-sustainability, and its materials and power are largely recyclable, reusable and recoverable. It has been fabricated in such a way as to minimize waste materials.

The sign nonetheless contains products and substances which, should the sign be dumped in the open, would contaminate the environment: it is mainly composed of aluminium, steel, electrical cables, pcb's, tinned copper, mono-component adhesive sealant, neoprene tape, paint, batteries, and generic electrical material.

When scrapping the sign or any part of it, to prevent environmental and health hazards due to improper disposal, the product and its accessories should be subjected to sorted 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, when scrapping the sign:

- avoid all damage and hazards to the health, safety and wellbeing 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 odours;
- safeguard the local flora and fauna and avoid damaging the environment and landscape;
- observe economic and territorial planning requirements.

3.5 ESD

Components of this system may be potentially damaged by electrostatic discharge. Always use a wrist grounding strap and/or a grounded antistatic floor mat when servicing the equipment.

All components that may be susceptible to damage by electrostatic discharge should be stored in suitable antistatic bags or other suitable containers.

4. TRANSPORT AND INSTALLATION

When unpacking, installing and activating the DC600, appropriate PPE (Personal Protection Equipment) must be worn.

4.1 Transport and storage

The DC600 is to be transported, especially by road, with suitable supports and packaging to protect it against impact, violent acceleration and vibration. Note that such repeated stresses during transport may damage the electrical and electronic systems and seriously compromise its operation, in whole or in part. During transport and storage, keep the DC600 under cover, in a clean area, preferably out of the weather.



Note: Aesys reserves the right to modify the transport, installation and commissioning specifications at any time as it deems fit.

4.1.1 Installation

We recommend fixing the DC600 vertically or slightly inclined downwardly, according to the vehicle typology, in order to increase the legibility of the LCD display. Moreover, in such a way, dust and other substances won't get inside the USB slot located on the front side of the DC600, preventing like this the correct data loading and functioning. The control unit has to be easily accessible to the driver and cables connected to the rear side of the DC600 should have enough space in a way that does not compromise the communication with displays and/or other equipments (GPS antenna, Wi-Fi antenna, etc).

The DC600 can be installed in 3 different ways, as described in the pictures below:

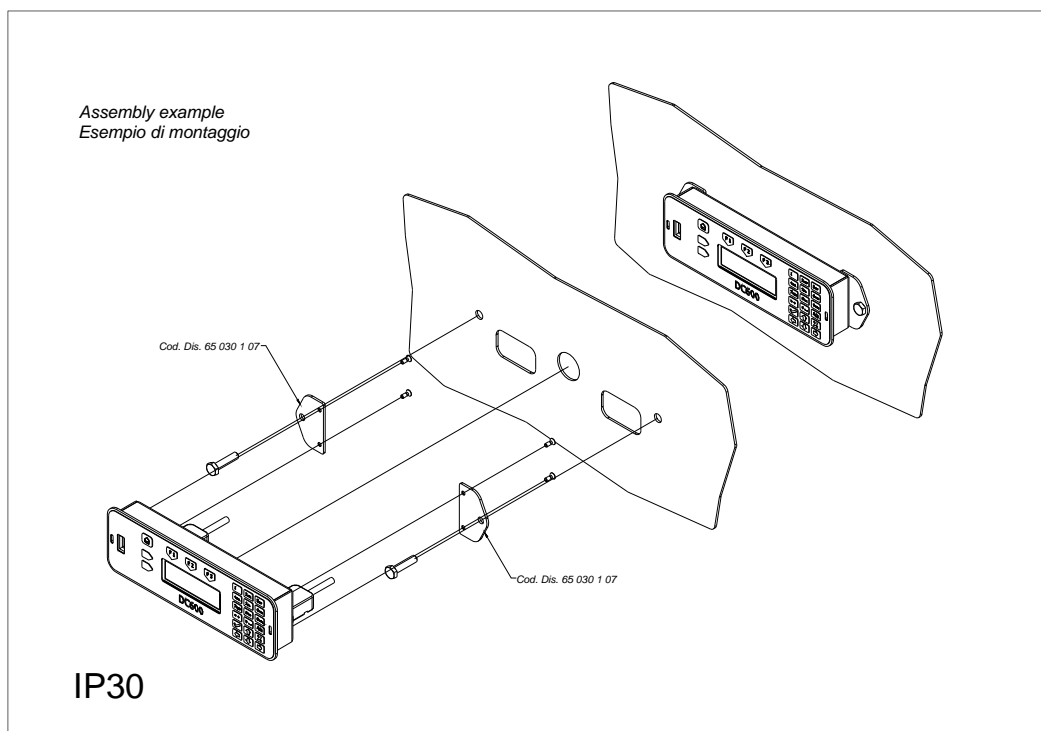


Fig. 4.1 – Type of installation - 1

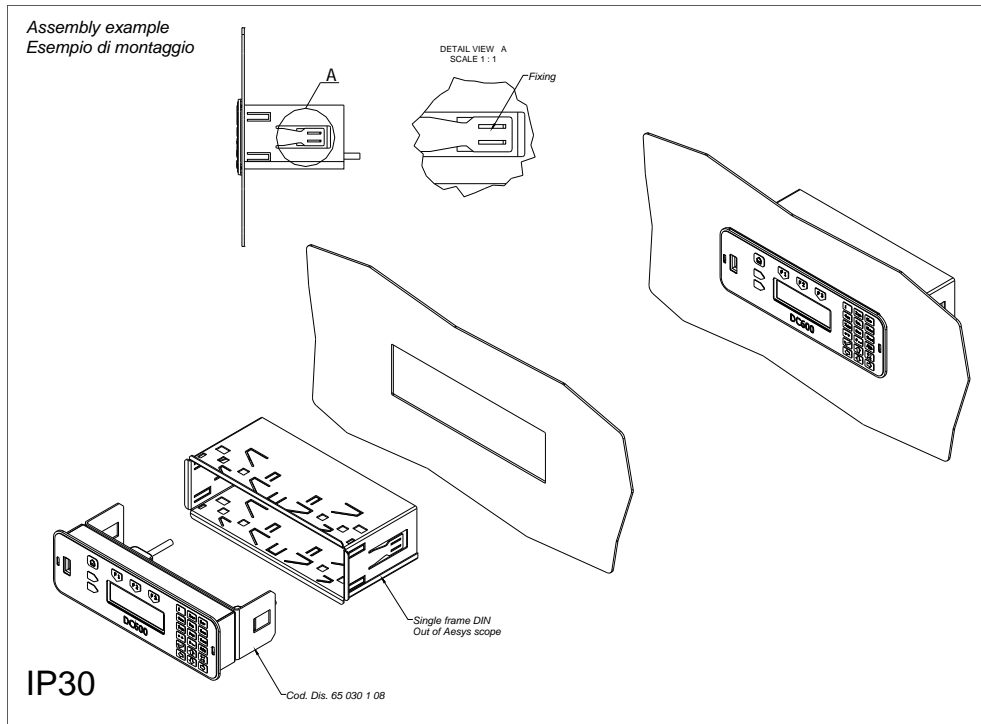


Fig. 4.2 – Type of installation - 2

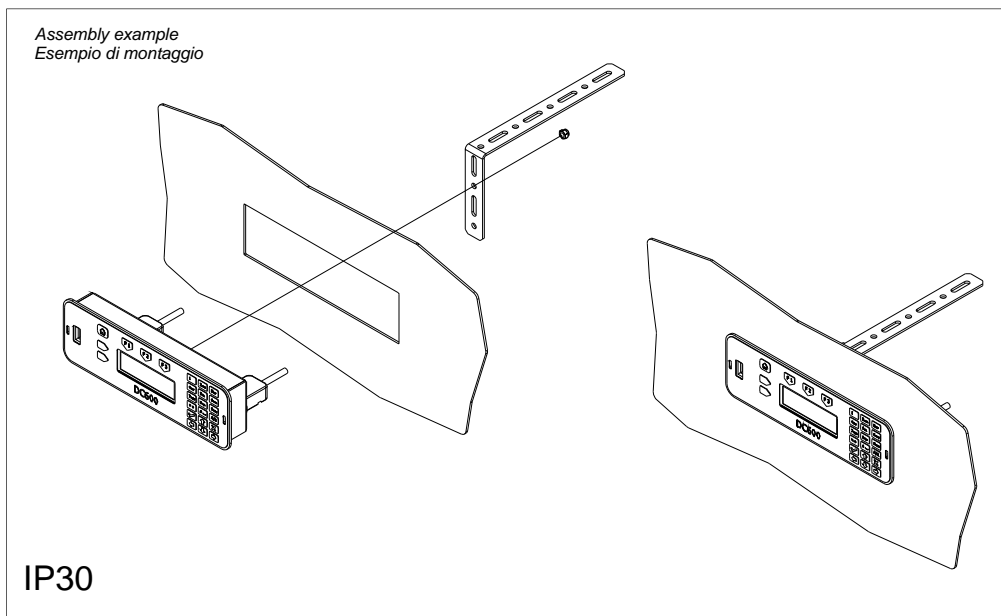


Fig. 4.3 – Type of installation - 3



Note: once assembly is complete, clean off any dust, grease or other substances from the exterior of the DC600. Use chemically non-aggressive cleaning materials.

4.1.2 Activation

Once the DC600 has been installed, it must be connected to the power supply through CN1 connector (+24Vdc) and to the existing serial interface through CN2 connector (RS485 or IBIS, it depends on the model) for its commissioning.



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

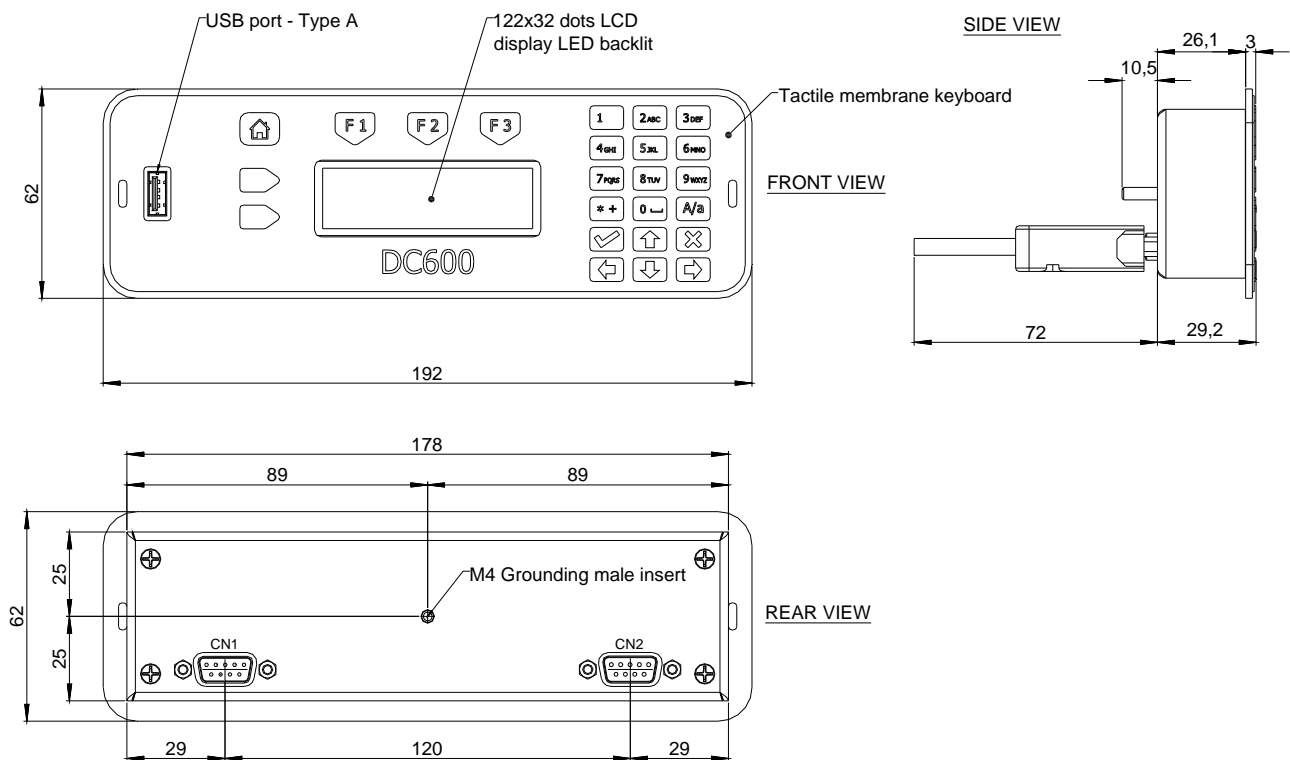


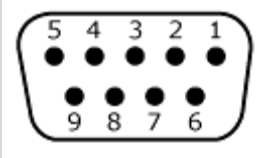
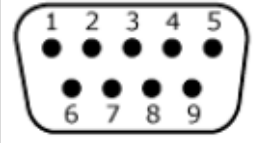
Fig. 4.4 – Dimensions and connections

The Fig. 2.14.4 shows the electrical and data connections to complete before activating the display.



Note: the mechanical drawings of any customized brackets are available on demand.

The Tab. 1 shows the connections of DC600 for the correct installation:

Connections		RS485 993301300200	IBIS Master 993301300201	IBIS Slave 993301300202
CN2 - D-sub 9P female 	1	RS485(1) B+	RS485(1) B+	RS485(1) B+
	2	RS485 COM	RS485 COM	RS485 COM
	3	RS485(2) B+	RS232(2) TX	NC
	4	RS232(1) RX	WBED (RX+)	WBSD (RX+)
	5	RS232(1) TX	WBSD (TX+)	WBED (TX+)
	6	RS485(1) A-	RS485(1) A-	RS485(1) A-
	7	RS485(2) A-	RS232(2) RX	NC
	8	NC	WBEM (RX-) / GND	WBSM (RX-)
	9	GND	WBSM (TX-) /GND	WBEM (TX-)
CN1 - D-sub 9P male 	1	INO+		
	2	INO-		
	3	IN1+		
	4	IN1-		
	5	OUT0+		
	6	0Vdc		
	7	0Vdc		
	8	+24Vdc		
	9	OUT0-		

Tab. 2 – Connections

5. TECHNICAL SPECIFICATIONS

The *Tab. 3* shows the main technical specifications of DC600:

TECHNICAL SPECIFICATIONS	
Dimensions:	Front plate: 192 (L) x 62 (H) x 28.3 (D) mm DIN Housing: 178 (L) x 50 (H) mm (according to ISO 7736)
Max. Weight:	0.66 Kg
Protection grade:	IP30 (according to ISO 20653)
Fixing points:	M4 male insert for bus converting fixing <i>Upon request Metal shell DIN plug adapter</i>
Input power supply voltage:	Nominal 24V _{DC} Range 9 ÷ 36 V _{DC} (according to ISO 16750-2)
Power consumption: @ T_a=25°C	5W Maximum
Operating temperature:	-20°C ÷ +65°C, Class A (according to ISO 16750-4)
LCD Display:	STN Yellow Transflective LCD, LED backlit 122 x 32 pixels
Keyboard:	22 keys (3 function keys) Telephone keypad (according to ISO9995-8) Tactile Membrane Keyboard, DIN size
Internal Memory:	4MB (for firmware and backup data) - 64MB Flash memory (optional)
Data Upload:	1x USB 2.0 Type A - Host
Data Interface: <i>* Depends on the model</i>	EIA RS485 * EIA RS232 * IBIS MASTER/SLAVE (VDV300) *

Tab. 3 – Technical specifications



Fig. 5.1 - Facsimile of CE nameplate



Note: make sure the CE nameplate is present. The serial number (S/N) uniquely identifies the DC600 when ordering spare parts (Fig. 5.1).

5.1 Functional block diagram

Here below the 2 different functional block diagrams of the DC600 control unit:

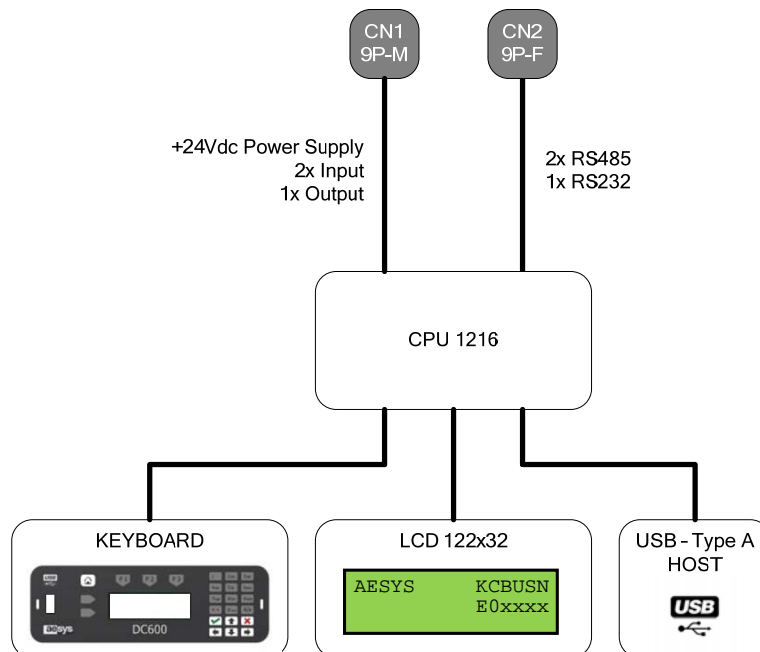


Fig. 5.2 – Functional block diagram of DC600 RS485

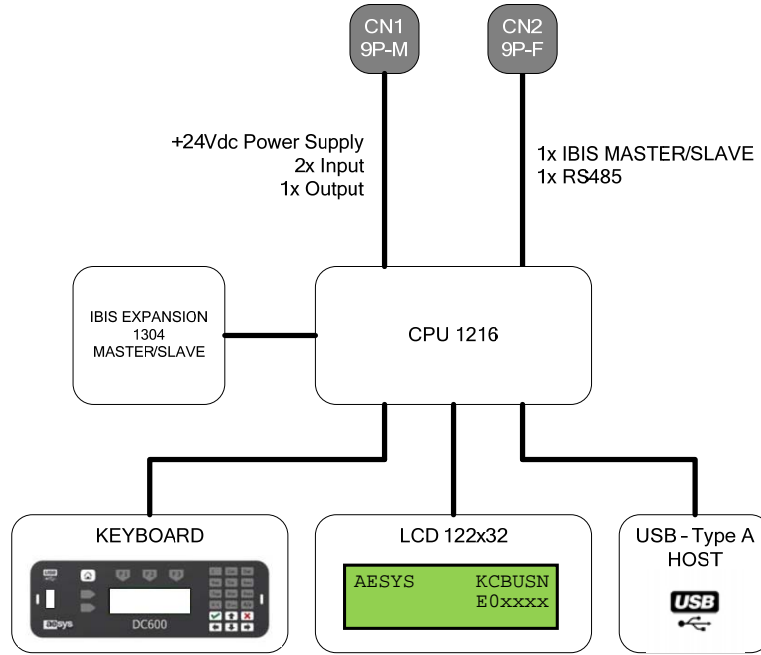


Fig. 5.3 – Functional block diagram of DC600 MASTER/SLAVE

6. SPARE PARTS

Below the spare parts list for each available model of DC600 control unit. When ordering spare parts to *Aesys Customer Service Aesys*, always specify CODE (if present).



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 sign's performance and service life, as well as being hazardous for its users.

6.1. Spare parts for model 993301300200 - DC600 RS485

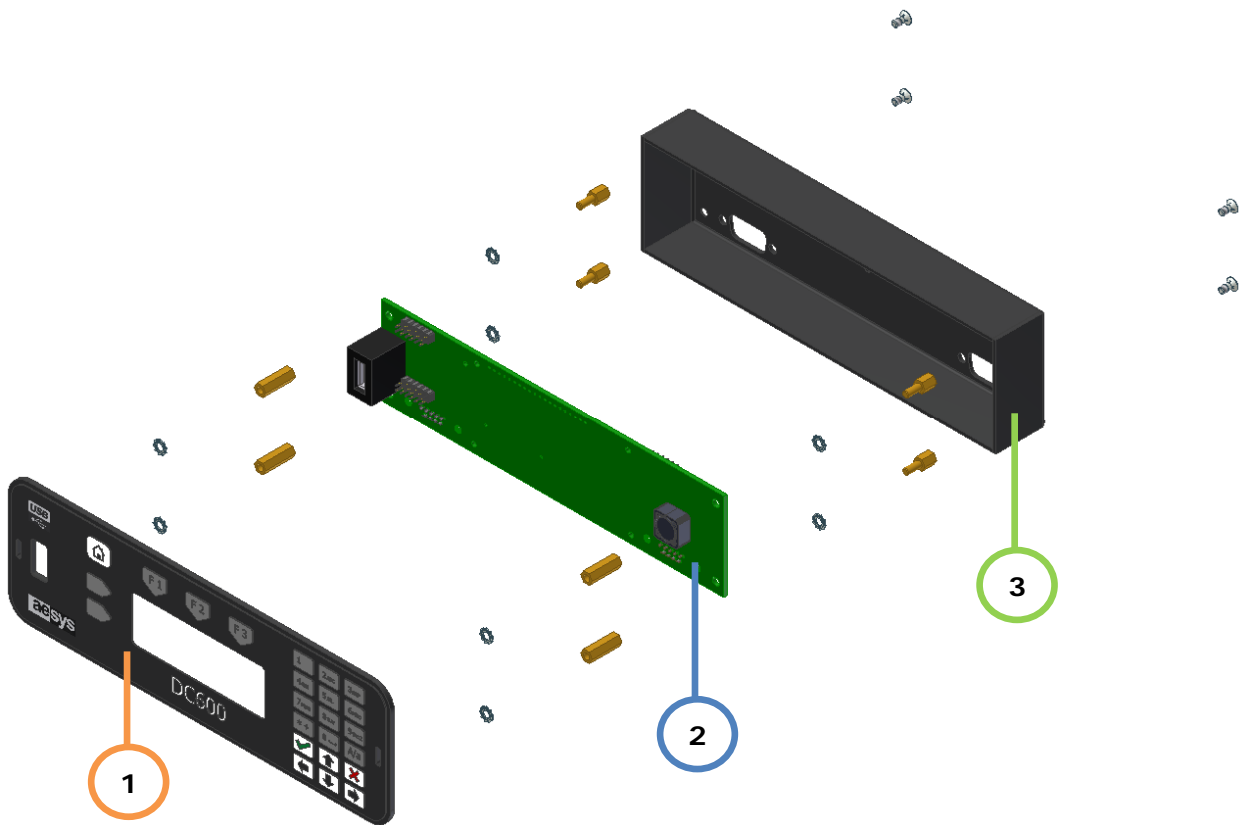


Fig. 6.1 – Internal layout of model DC600 RS485

Number	Description	Q.ty	Aesys Code
1	Keyboard Assembly	1	65030312
2	CPU board 1216	1	140031674
3	Metal Shell	1	65030106

Tab. 4 – List of spare parts of model DC600 RS485

6.2. Spare parts for model 993301300201 - DC600 IBIS MASTER

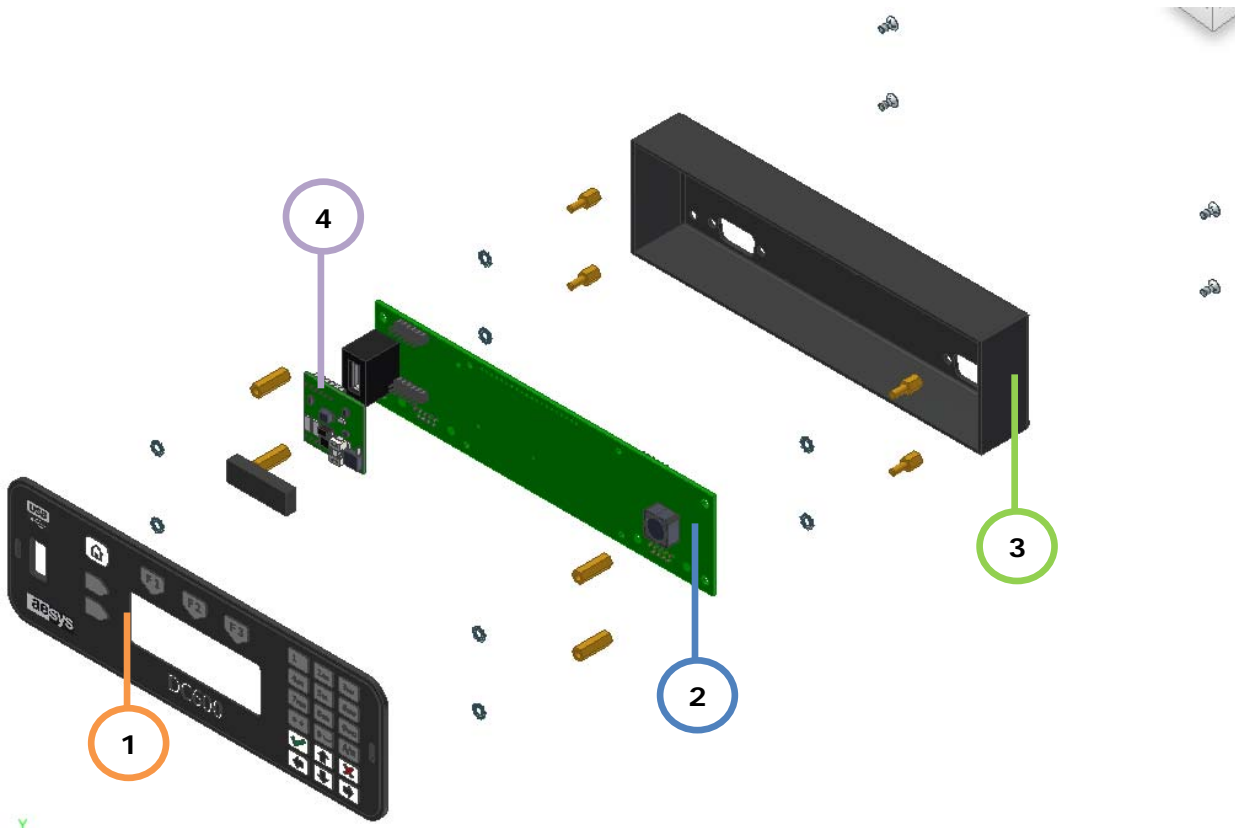


Fig. 6.2 – Internal layout of model DC600 IBIS MASTER

Number	Description	Q.ty	Aesys Code
1	Keyboard Assembly	1	65030312
2	CPU board 1216	1	140031676
3	Metal Shell	1	65030106
4	IBIS MASTER Expansion 1304	1	140031675

Tab. 5 – List of spare parts of model DC600 IBIS MASTER

6.3. Spare parts for model 993301300202 - DC600 IBIS SLAVE

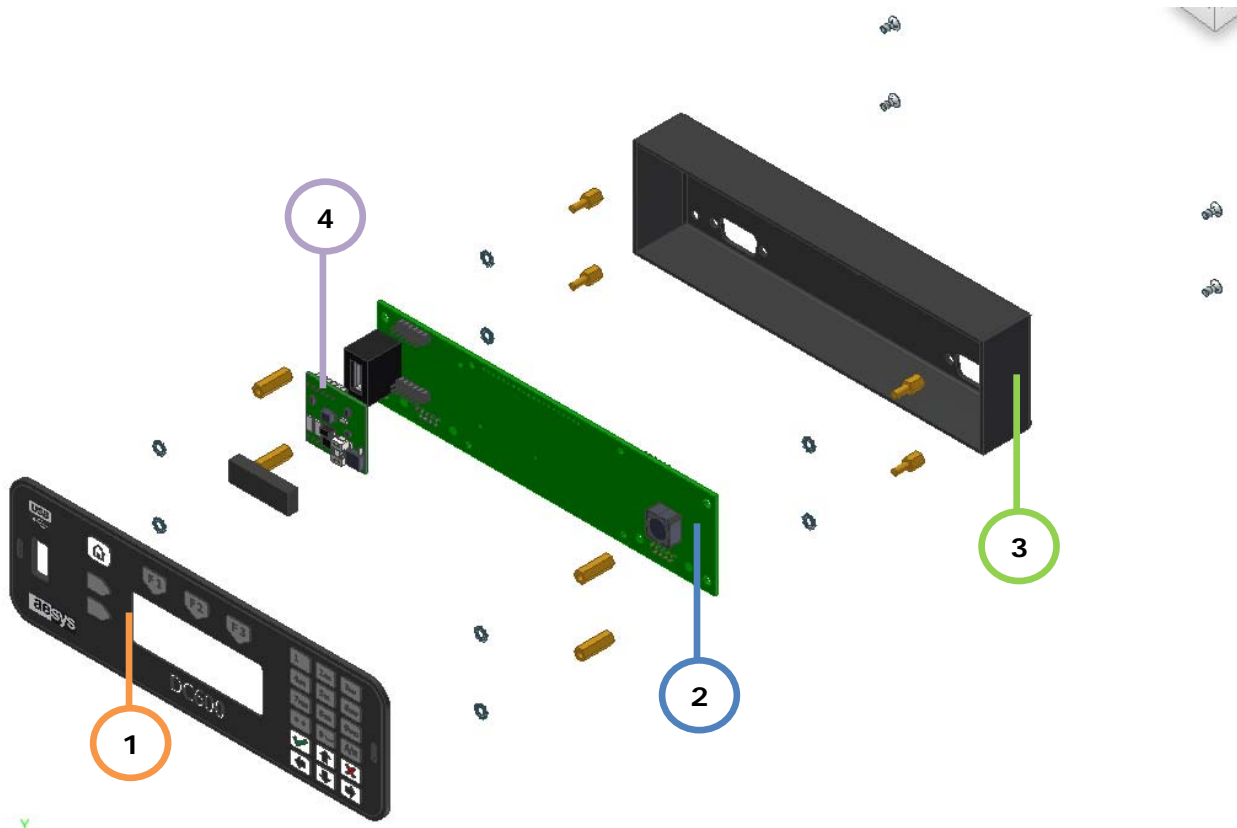


Fig. 6.3 – Internal layout of model DC600 IBIS SLAVE

Number	Description	Q.ty	Aesys Code
1	Keyboard Assembly	1	65030312
2	CPU board 1216	1	140031676
3	Metal Shell	1	65030106
4	IBIS SLAVE Expansion 1304	1	140031677

Tab. 6 – List of spare parts of model DC600 IBIS SLAVE

7. DESCRIPTION OF THE SPARE PARTS

This chapter analyses the electrical section of the DC600 by giving a short description of the components and their functions.

7.1. CPU board (1216)

Aesys code: 140031674 for DC600 RS485

Aesys code: 140031676 for DC600 IBIS MASTER/SLAVE

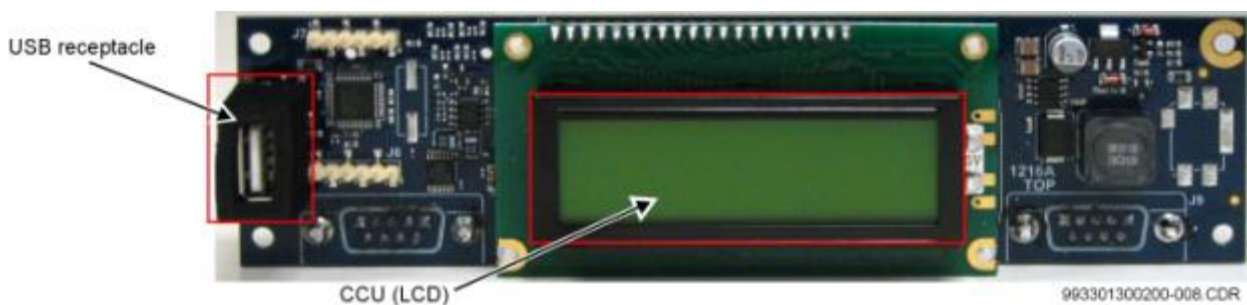


Fig. 7.1 - CPU 1216 – Top View



Fig. 7.2 - CPU 1216 – Bottom View

The basic electronic component of the system is the CPU board. The CPU board is composed of the microprocessor, EPROM memory, and other accessory components. Taking into context the components just mentioned, the operation of the CPU can be explained as follows:

- Data and operation programs are stored in EPROM memories. At system start-up, activating programs (BOOT sequences) are uploaded into the RAM memory. In the RAM memory, these programs are used by the microprocessor for the activation of its internal components.
- Once the phase of start-up has passed, the data related to the information to be used is taken from a specific EPROM memory, commanded by the microprocessor.
- The microprocessor sends this data to the output peripheral using the FIRMWARE program.
- This data reaches the signs and other system components.
- Data transmission between the CCU and the signs is performed by using typical standards for these systems. In particular, the model RS485 communicates through a RS485 serial interface

while the model IBIS communicate through the standard IBIS VDV 300 in configuration MASTER or SLAVE.

- The microprocessor is the component through which it is possible to transmit data allowing the functioning of both CCU and signs.
- The CCU has two EPROM memories. One is specific for data information storage related to routes to be displayed and the other contains the boot program and the operating software.
- At this point, the CCU is able to work autonomously on the basis of input received from the operator through the keypads.

Other accessory components present in the CCU are:

- Special DB9 connectors are used for the power thus allowing the data receipt coming from the input peripheral (if present) and the transfer of information packets addressed to the signs.
- The slot for the insertion of the USB pen drive, from which the user can load the special EPROM memories with customer data and operation firmware.

7.2. IBIS EXPANSION board (1304)

Aesys code: 140031676 for DC600 IBIS MASTER

Aesys code: 140031677 for DC600 IBIS SLAVE

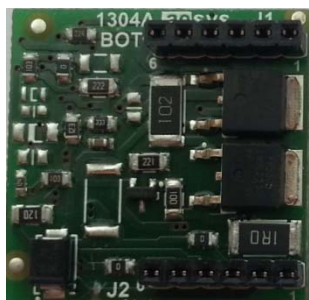


Fig. 7.3 – IBIS MASTER Expansion Board 1304 – Bottom and Top View



Fig. 7.4 – IBIS SLAVE Expansion Board 1304 – Bottom and Top View

Once connected to the CPU 1216 through strip connector placed on the bottom side (see Fig. 7.3-7.4), the IBIS expansion board 1304 adds a serial communication with the standard IBIS (VDV300) in both configuration MASTER/SLAVE, depending on the model of 1304 used.

8. COMMISSIONING

8.1. Start-Up / Power ON Self Test (POST)

At start-up when power is first applied, the DC600 (called simply CCU) boots up and the information shown in Fig. will appear on the LCD screen for approximately three seconds.

The boot program represents the first instructions at Power On Self Test (POST), then displays the Aesys logo (see Fig.8.1), then displays Boot/configuration firmware version KCBUSADC1/E3C27B (see Fig.8.2). Finally during the last execution displays the Customer Code Number/Message (see Fig.8.3).



Note: The Boot/Configuration Firmware Version, and Customer Code Number/Message may vary depending on the customer, latest version updated, or purchase date of sign.



Fig.8.1 — Start-Up and Aesys Logo Will Appear

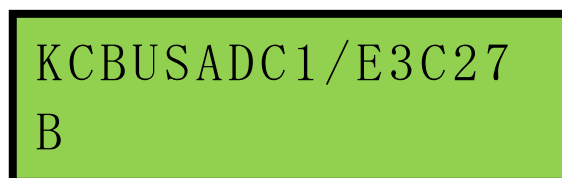


Fig.8.2 — DC600 Boot/Configuration FW Number



Fig.8.3 — Code Number/Customer Message

8.2. Uploading Data

Referring to Fig. 8.4, the Detail Views show the Receptacle Positioning Key inside the USB Receptacle. Ensure that the USB drive is properly aligned and then carefully install the USB flash drive into the USB Receptacle.



Fig.8.4 — DC600 Flash Drive Location and Connection Receptacle

Once the USB flash drive is installed all the way into the slot, the CCU/LCD will display “Select data file” and the Customer (TRX) File Name. Refer to Fig.8.5.



Fig.8.5 — Select Data File and Customer (TRX) File Name

After selecting the TRX file then pushing the <Enter/Select> key, the following sequence of information will appear on the LCD:

- READING / (% symbol may appear based on TRX file size)
- SAVING.... Wait
- STORED OK, and then
- Now Code # and message.



Note: uploading TRX file time will vary depending upon size of message listing/TRX file.

8.3. Selecting and Executing Destination/Message to Sign

Referring to Fig. 8.6, after the program/TRX file has been successfully loaded, the user can start displaying messages or destinations on the sign by using the following keys:

- Numeric keypad — Type in the destination code number on the keypad or use the Up Arrow or Down Arrow to select the desired message
- <Enter/Select>-key — Press the <Enter/Select> key to send the message to sign
- <Clear Display> key — Press <Clear Display> key and press <Enter/Select> key to clear/disable the signs
- <Up Arrow> — This key starts the message list from the first message/destination entered, then counts down, and
- <Down Arrow> — This key starts the message list from last message/destination entered then counts up.

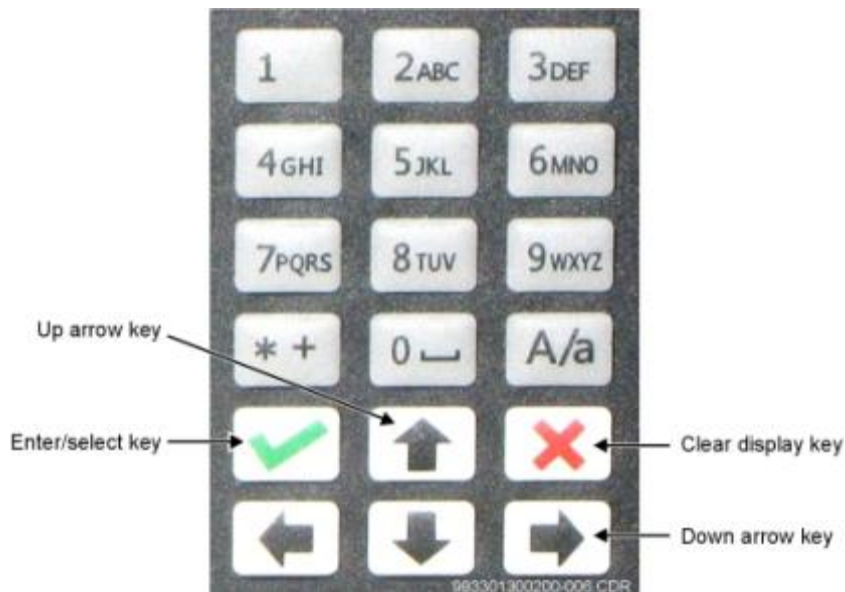


Fig.8.6 — DC600 Central Control Unit, Selected Features II

After you select the destination or message, you must press <Enter/Select> to transmit that message to the sign. The LCD display will show “OK” then display the Code Number/Message selected.

8.4. CCU Transmission/Communication Error (Status 2)

This error represents a general communication error from the CCU to destination sign. If the “Status 2” error occurs, check the letter that is vertically above that number “2,” which would indicate the sign with the communication problem.

Shown in Fig. 8.7 is an error on the letters A and C, indicating there is a communication problem with the front and rear sign. Shown in Fig.8.8 is a “Status 2” error with the letter B, indicating there is a communication problem with the side sign.

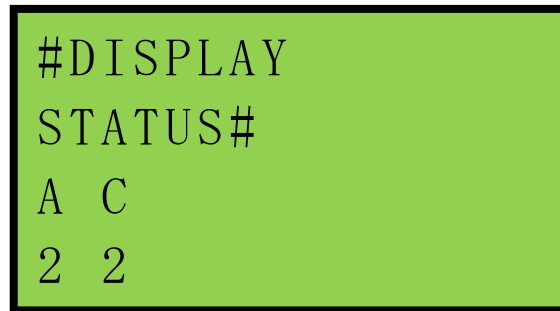


Fig.8.7 – Error on the Letters A and C



Fig.8.8 – Error with the Letter B

8.5. “Status 2” Error Troubleshooting Guide

To troubleshoot a “Status 2” error perform the following steps:

- 1) Verify which sign has the “Status 2” error. If using a sign with embedded CCU, the problem may be internal so contact Aesys technical support for further assistance.
- 2) Check to ensure the sign has power.
- 3) Check to see if the sign has properly booted (four LEDs should be present in the right lower corner).
- 4) Check data communication cable connection from the CCU to destination sign.
- 5) Check the address configuration for the destination sign and CCU. Both addresses for the sign and the CCU should be the same. The sign address letter is sometimes located on the silver label mounted on the rear side of sign.

The letters shown below represent the address for each sign as follows:

- A = Front
- B = Side (Optional)
- C = Rear (Optional)
- G = Dash (Optional)
- D = Internal (Optional)



Note: the sign address letter may vary depending on your sign type or configuration. If your configuration consists of two or more signs or a rainbow type sign, contact Aesys technical support to verify the configuration is correct.

8.6. CCU LCD/Message Display

After the message has been successfully sent to the signs, the CCU (LCD) will display the code number with destination/message. Fig. 8.9 shows a sample code number and destination message. “000019” is the code number, “Norristown Limited” is the destination message.



Note: The message formatting on the CCU (LCD) has no effect on the sign message. In other words, the CCU (LCD) and the sign message/formatting could look totally different.



Fig.8.9 — Sample Code Number and Destination Message

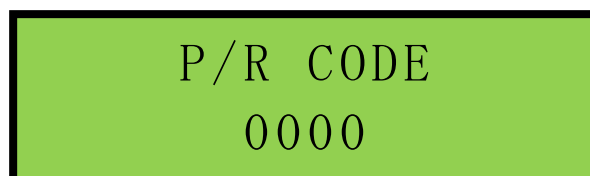


Fig.8.10 — Public Relations (P/R) Code Number on the LCD



Note: Public Relations (P/R) messages are defined as seasonal holiday-type messages (for example, “Happy Holidays” or “Happy New Year,” etc.).

8.7. Non-existent Code

The warning message shown in Fig. **Errore. L'origine riferimento non è stata trovata.8.11** will appear on the CCU display only if the code number entered does not exist in your message listing.



Fig.8.11 — Non-existent Code Message

8.8. Using the Scrolling Keys (<Up Arrow > and <Down Arrow>)

The <Up Arrow> and <Down Arrow> keys are used to scroll up or down throughout the entire destination list. When the desired code number or destination is selected, press the <Enter/Select> key to send the information to the sign.

8.9. Blanking/Disabling the Sign

Referring to Fig. 8.12 and Fig. 8.13, to blank the signs (turn off all LEDs) press the <Clear Display> key until the LCD shows “Clear display?” Then press the <Enter/Select> key the message “Display disabled” appears on the LCD as shown in Fig. 8.13 to confirm that the signs are blank/disabled.



Fig.8.12 — Disable Displays Prompt



Fig.8.13 — Disabled Display Confirmation

8.10. Sign Brightness Adjustment Feature (<F3>)

The default brightness setting is “0” (zero). This means the sign is set for automatic brightness adjustability and depending upon the ambient light directed to the sign, there are 16 possible brightness levels.

To manually change the automatic brightness to another value, perform the following steps:

- 6) Press the <F3> key and the Maintenance Menu Screen selection screen will appear. Refer to Fig. 8.14.

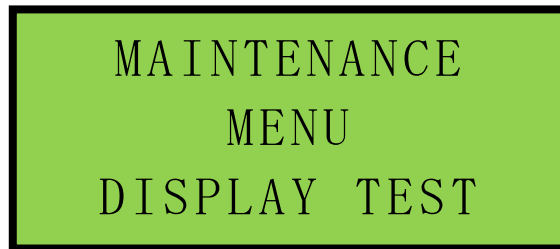


Fig.8.14 — Display Selection Screen

- 7) Press the <Up Arrow> key to select the Display Bright option, then press the <Enter/Select> key to show Display bright: 0 information (see Fig. 8.15).

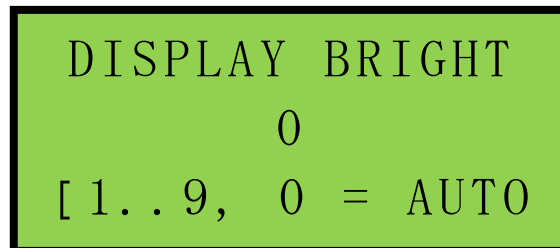


Fig.8.15 — Sign Selection Screen

- 8) Using the numeric keypad, enter a number from one through nine, where 1 = minimum brightness and 9 = maximum brightness.
- 9) Press <Enter/Select> to save the new brightness level.
- 10) To reset the brightness back to Auto, follow steps 1 through 4 and select number “0” or remove the power.

8.11. CCU Technical Information Supplement

The sections that follow are supplemental and include special features and operations as well as hardware-related information.

8.11.1 Viewing Other Destination Message Timeout

If scrolling through your destination list and no keys are pressed for approximately 30 seconds, the CCU will automatically revert to the current destination message on the sign.

To revert to the original destination message manually, press the <Home> key one time.

8.11.2 Uploading Firmware

The main process in uploading the firmware program to the CCU is using a USB flash drive.

To update the firmware, perform the following steps:

- 1) copy the “XXXX.FLA” file provided by Aesys into the main directory of the USB pen-drive,
- 2) insert the USB pen-drive into the slot in the front,
- 3) with the USB pen-drive, press and hold the HOME key until when the updating process starts,
- 4) power the DC600 CCU and wait for the end of the firmware updating,
- 5) remove the USB pen-drive.

During firmware update, the following sequence of information will appear on the LCD:

- READING / (% symbol may appear based on FW file size)
- SAVING.... Wait
- STORED OK, and then
- reboot

8.11.3 Additional Software Considerations:

Programs present in the CCU are:

- The start-up program (BOOT), which allows the startup of the DC600 CCU
- The FIRMWARE which allows operation of the CCU, and
- The TRX file format that contains the information list required to display on the signs.

9. MAINTENANCE

DC600 is made of components that normally do not require maintenance. However, for the correct working, it is periodically necessary to perform preventive maintenance actions (cleaning, visual check) in order to ensure long life to the DC600.

This paragraph aims at describing the procedures to replace internal circuit boards or spare parts.



Note: we recommend that the user contact Aesys personnel if any anomalies with the DC600 occur. Aesys cannot be responsible in the case of display system intervention by unauthorized personnel.

For the internal maintenance, use special spanners/wrenches (Fig. 9.1 and 9.2).



Fig. 9.1 – Hexagonal socket spanner

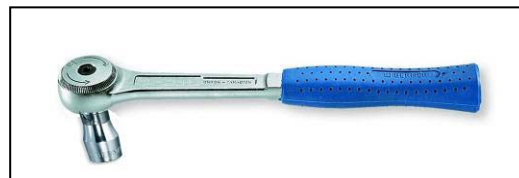


Fig. 9.2 – Hexagonal ratchet spanner

Refer to Table 1 for the right match between the hexagonal nuts and the corresponding ratchet spanners in order to replace electronic boards or damaged components. The table below gathers all types of nuts that Aesys uses for its wide series of displays.

MATCH	
N° hexagonal nut	N° ratchet spanner
M2.5	5
M3	5.5
M4	7
M5	8
M6	10
M8	13
M10	17
M12	19

Tab. 7 – Match between nuts/spanners

9.1. Replacement of electronic boards

For faulty or malfunctioning parts or in general during maintenance, the replacement procedure is as follows:

- shut off power to the DC600;
- disconnect the electrical connector on the faulty device;
- undo the lock nuts securing the device using the appropriate spanner;
- replace the part and restore the locknuts and electrical connections;
- restore power and test the operation of the new device.



Note: when replacing faulty electronic boards, check the dipswitch settings and replicate them on the new unit. Refer to the wiring diagrams.

10. DIAGNOSTICS

This chapter provides troubleshooting instructions to diagnose and locate problems or damage to the sign system. Knowledge of the normal operation and the functions of the system, as explained throughout this manual, are essential for a correct diagnosis and repair.

The troubleshooting categories covered are as follows:

- Hardware-related troubleshooting
- CCU troubleshooting

For information about sign troubleshooting, contact AESYS Technical Support personnel.

Symptom	Possible Cause	Corrective Action
Hardware anomalies (housing, keyboard, LCD screen)	<ul style="list-style-type: none"> ▪ Damaged hardware component 	<ul style="list-style-type: none"> ▪ Contact Aesys for repair or replacement

Tab. 8 –Hardware-related Troubleshooting

Symptom	Possible Cause	Corrective Action
Not powering on	<ul style="list-style-type: none"> ▪ Check power supply to CCU for correct voltage (12 – 24 V DC). ▪ Check power supply connection to CCU. ▪ Verify the correct polarity from power source to CCU ▪ Possible water damage. 	<ul style="list-style-type: none"> ▪ Replace the power supply to the CCU. ▪ Check the cable connection from the power supply to the CCU (CN1). ▪ If CCU has water damage, replace the CCU.
Transmission Error/Status “2”	<ul style="list-style-type: none"> ▪ Data cable from CCU to sign is disconnected. ▪ Address configuration setup for CCU and sign is not compatible. 	<ul style="list-style-type: none"> ▪ Check the data cable connection at CN2 for loose connection. ▪ Remove DB9 housing and inspect wire/solder connections. ▪ Replace the data cable. ▪ Be sure to check the sign address and ensure that it is compatible with customer message listing address. ▪ If all actions above are checked and the problem still exists, replace the DC600 CCU.
Non-existent Code.	<ul style="list-style-type: none"> ▪ Code number entered does not exist in your message listing/TRX file. 	<ul style="list-style-type: none"> ▪ Update the message listing with new code number and destination, OR ▪ Enter a valid code number.
No Route in Memory	<ul style="list-style-type: none"> ▪ TRX file/message listing deleted 	<ul style="list-style-type: none"> ▪ Install a new TRX file/message listing

Tab. 9 –DC600 Troubleshooting

11. ENCLOSURES

11.1 Wiring diagrams

The wiring diagrams are enclosed with this manual.

11.2 Bracket drawings

The mounting brackets drawings are enclosed with this manual only if designed by Aesys S.p.A.