

Technical documentation
 last changed on: 2021-12-17

ECH 238

8 Slot 19" MMS-Crate Series for iseq MMS High Voltage Power Supply Modules

- up to 8 MMS High Voltage Power Supply Modules
- 1200W power
- wide range of HV-modules
- optional fan unit
- optional UPS



Document history

Version	Date	Major changes
1.2	2021-12-17	improved documentation, Fan unit, description Options, new figures, Package contents / Accessories
1.1	2020-11-10	improved documentation
1.0	2020-09-16	Relayouted version

Disclaimer / Copyright

Copyright © 2021 by iseg Spezialelektronik GmbH / Germany. All Rights Reserved.

This document is under copyright of iseg Spezialelektronik GmbH, Germany. It is forbidden to copy, extract parts, duplicate for any kind of publication without a written permission of iseg Spezialelektronik GmbH. This information has been prepared for assisting operation and maintenance personnel to enable efficient use.

The information in this manual is subject to change without notice. We take no responsibility for any mistake in the document. We reserve the right to make changes in the product design without reservation and without notification to the users. We decline all responsibility for damages and injuries caused by an improper use of the device.





Safety

This section contains important security information for the installation and operation of the device. Failure to follow safety instructions and warnings can result in serious injury or death and property damage.

Safety and operating instructions must be read carefully before starting any operation.

We decline all responsibility for damages and injuries caused which may arise from improper use of our equipment.

Depiction of the safety instructions

DANGER!	
 DANGER!	"Danger!" indicates a severe injury hazard. The non-observance of safety instructions marked as "Danger!" will lead to possible injury or death.
WARNING!	
 WARNING!	"Warning!" indicates an injury hazard. The non-observance of safety instructions marked as "Warning!" could lead to possible injury or death.
CAUTION!	
 CAUTION!	Advices marked as "Caution!" describe actions to avoid possible damages to property.
INFORMATION	
 INFORMATION	Advices marked as "Information" give important information.



Read the manual.



HIGH VOLTAGE

Attention high voltage!



Important information.

Intended Use

The device may only be operated within the limits specified in the data sheet. The permissible ambient conditions (temperature, humidity) must be observed. The device is designed exclusively for the generation of high voltage as specified in the data sheet. Any other use not specified by the manufacturer is not intended. The manufacturer is not liable for any damage resulting from improper use.

Qualification of personnel

A qualified person is someone who is able to assess the work assigned to him, recognize possible dangers and take suitable safety measures on the basis of his technical training, his knowledge and experience as well as his knowledge of the relevant regulations.

General safety instructions

- Observe the valid regulations for accident prevention and environmental protection.
- Observe the safety regulations of the country in which the product is used.
- Observe the technical data and environmental conditions specified in the product documentation.
- You may only put the product into operation after it has been established that the high-voltage device complies with the country-specific regulations, safety regulations and standards of the application.
- The high-voltage power supply unit may only be installed by qualified personnel.

Important safety instructions

DANGER!



DANGER!

This device is part of a high voltage supplying systems.
High voltages are dangerous and may be fatal.

USE CAUTION WHILE WORKING WITH THIS EQUIPMENT.
BE AWARE OF ELECTRICAL HAZARDS.

Always follow at the minimum these provisions:

- High voltages must always be grounded
- Do not touch wiring or connectors without securing
- Never remove covers or equipment
- Always observe humidity conditions
- Service must be done by qualified personnel only

WARNING!



WARNING!

To avoid injury of users it is not allowed to open the unit. There are no parts which can be maintained by users inside of the unit. Opening the unit will void the warranty.

WARNING!



WARNING!

Before connecting or disconnecting HV cables or any operation on the HV output or the application, the unit has to be switched off and discharge of residual voltage has to be finished. Depending on application residual voltages can be present for long time periods.

WARNING!



WARNING!

Do not operate the unit in wet or damp conditions.

WARNING!



WARNING!

Do not operate the unit in an explosive atmosphere.

WARNING!



WARNING!

Do not operate the unit if you suspect the unit or the connected equipment to be damaged.

WARNING!



WARNING!

The protective conductor connection must be ensured by an appropriate mains cable. Before connecting to the local power supply, check whether the nominal voltage of the devices corresponds to the mains voltage.

WARNING!



WARNING!

Risk of death due to electric shock!
Disconnect the appliance from the mains before carrying out any work. Do not open the housing of the unit!

WARNING!



WARNING!

The mains connection is made with basic insulation and protective conductor. The device may only be operated with the protective earth conductor (PE) connected!

The protective conductor connections must be checked for proper function after installation.

CAUTION!



CAUTION!

When installing the units, make sure that an air flow through the corresponding air inlet and outlet openings is possible.

CAUTION!



CAUTION!

Risk of injury due to the weight of the device
Incorrect lifting and transport of the device can cause injuries.

- Transport and lift the device carefully. Pay attention to the weight of the product.
- Wear suitable personal protective equipment for all work on the product.
- Use suitable transport and lifting equipment.

INFORMATION



INFORMATION

Please check the compatibility with the devices used.

Table of contents

Document history	2
Disclaimer / Copyright	2
Safety	3
Depiction of the safety instructions	3
Intended Use	4
Qualification of personnel	4
General safety instructions	4
Important safety instructions	5
1 General information	9
2 Package contents / Accessories	9
3 Options	9
4 Technical data	10
4.1 Crate – ECH238	10
4.2 Controller – CC238	11
5 Overview	12
6 Operation and maintenance	13
6.1 FAN unit (optionally)	13
6.2 UPS (optionally)	13
6.3 Safety-Loop	14
6.4 SL2 – INHIBIT	16
6.5 Status LEDs	16
6.6 Bank select switch	16
6.7 Forced air cooling	17
6.8 CAN-Interface	18
6.9 External CAN Bus	18
7 Dimensional drawings	19
8 Connectors and PIN assignments	24
8.1 Safety Loop socket (SL1)	24
8.2 INHIBIT (SL2)	24
8.3 CAN HV / CAN CC (RJ45)	24
9 Accessories	25
10 Order guides	25
11 Appendix	25
12 Warranty & Service	26

13	Disposal	26
14	Battery	26
15	Manufacturer contact	26

1 General information

These crate devices are used for operating iseq high voltage power supply modules in a desktop compatible case. Up to 8 slots for MMS high voltage modules are provided. Each module is connected to the backplane of the crate by a vendor specific 96 pin connector. For control and network communication of the MMS modules a crate controller needs to be plugged into the special Crate Controller Slot.

2 Package contents / Accessories

Hardware	included	optional
ECH 238	Controller CC238, AC power line cable (Z592069), 2x CAN Termination RJ45 (Z583380), CAN Adapters RJ45 to SUB-D-9 Connector (Z583382), CAN Adapters RJ45 to SUB-D-9 Socket (Z583401)	See chapter 9 Accesories
ECH 238 with FAN unit		
ECH 238 with FAN unit and UPS		

Table 1: Package contents

3 Options

OPTIONS	OPTION CODE	EXAMPLE	ITEM CODE HEX CODING
Additional fan unit	FAN	ECH 238 FAN	-
Uninterruptible power supply	UPS	ECH 238 UPS	-

Table 2: Options

4 Technical data

4.1 Crate – ECH238

SPECIFICATIONS		ECH 238
Slots		8 x MMS modules and 1 x Crate controller (CC238)
Rated AC mains input		190 ... 264 VAC
Fuse		internally fused, not exchangeable
AC power connector		IEC 320 C14T
DC module supply voltages		+24 V +5V
DC output power		1200 W
Connection		CAN
Cooling		Free air flow necessary, optional: Fan unit
Operation temperature		0 ... 50°C ambient without derating
	Option UPS	+10 ... +50°C
Storage temperature		-20 °C ... +70 °C
	Option UPS	-20 °C ... +50 °C
Floating PE to DC 0V		Clamped ±47 V
Dimensions (L/W/H)		450mm / 19" / 6U
	Option FAN	450mm / 19" / 7U
Weight ⁽¹⁾		Up to 21 kg
Notes: ¹⁾ with OPTION UPS and FAN		

Table 3: Technical data

4.2 Controller – CC238

The connection with mains is made through an inlet connector on the rear side of the device. The mains switch is also located at this place. The fuse is permanently installed on the controller. It cannot be changed by the customer.

SPECIFICATIONS	Controller CC238
CAN bus speed	20, 50, 100, 125 and 250 kbit/s
Analogue functions	ADC with 10-Bit resolution, control of supplies voltages and temperature of this crate.
Digital functions	ON – and OFF switch of internal supply voltages via CAN-Bus in Stand-by mode.
Power-ON/OFF	Power cable connected and AC line is ON, now the crate is in Stand-by mode. In Stand-by mode the internal DC supply voltages can be switched ON and OFF with help of a push button, even if no CAN-control is present.
With option UPS	In case of AC power failure the internal voltages are saved by the acc. Battery. If the power is failing more than 10 sec. a signal will be provided, which is going to start a defined shut down procedure.

Table 4: Technical data CC238

5 Overview

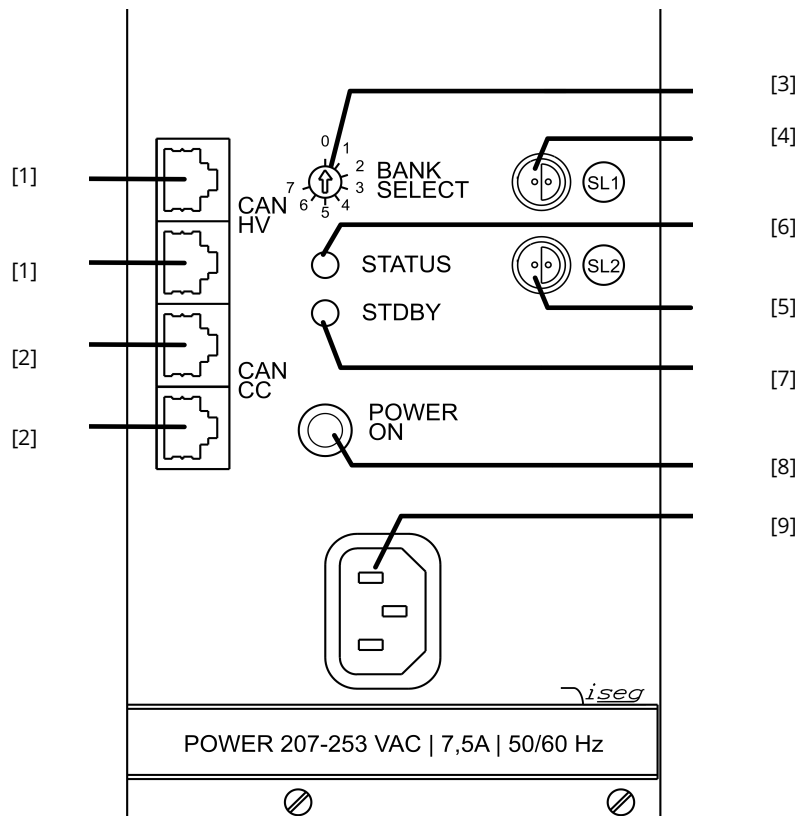


Figure 1: Front panel cutout

Number	Name	Description	chapter
[1]	HV module CAN-Bus	CAN-IN, termination or CAN-OUT to more CAN nodes	6.8 CAN-Interface 6.9 External CAN Bus
[2]	Crate Controller CAN-Bus	CAN-IN, termination or CAN-OUT to more CAN nodes	6.8 CAN-Interface 6.9 External CAN Bus
[3]	BANK-SELECT-switch	select bank with fixed Module address (up to 8 Crates with 64 modules)	6.6 Bank select switch
[4]	SL1	SAFETY LOOP 1	6.3 Safety-Loop
[5]	SL2	SAFETY LOOP 2	6.4 SL2 - INHIBIT
[6]	STATUS LED	POWER-ON	6.5 Status LEDs
[7]	STDBY LED	AC-supply ON	6.5 Status LEDs
[8]	POWER-ON	ON - OFF switch Supply	
[9]	Main power		Table 3: Technical data

Table 5

6 Operation and maintenance

6.1 FAN unit (optionally)

Optionally the Create can be equipped with the 1U 19" iseq fan unit. This is mounted on the Create.

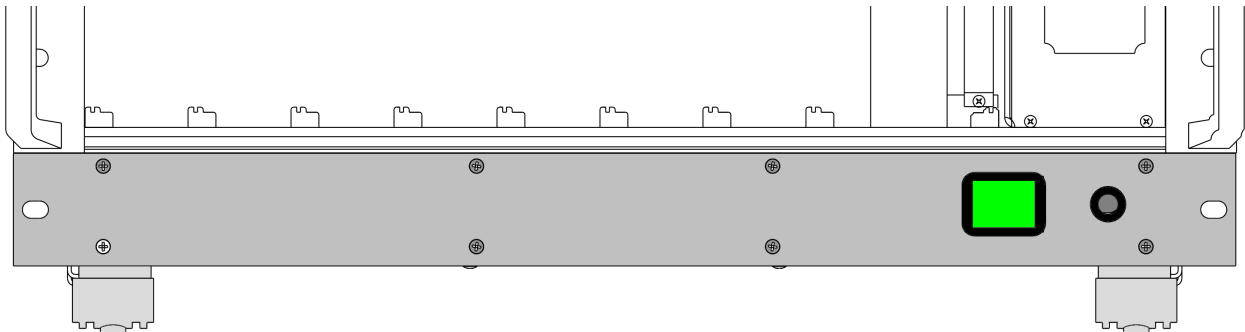


Figure 2: Option: FAN unit

6.2 UPS (optionally)

WARNING!



WARNING!

Batteries and rechargeable batteries do not dispose in regular residual waste. You are legally obliged to return used batteries and rechargeable batteries to a municipal collection point or to local retailers. Used batteries may contain harmful substances that can harm the environment or your health if not stored or disposed of properly.

CAUTION!



CAUTION!

For transport, the fuse on the back (Figure 3: Fuse holder) of the device must be removed!

CAUTION!



CAUTION!

The crate and the included battery are free from any support. If the crate is not in use for more than half a year it has to be connected to mains and switched ON for at least 8 hours, so that the batteries will be charged to full capacity again. After 5 years time the batteries have to be replaced by new ones.

Together with an UPS and a battery back up, short term power failure (<10s) can be bridged and in case of longer AC power failure a defined shut down procedure for the HV modules is guaranteed. After unpacking the crate has to be installed under the described condition. For crates with UPS option the 16A fuse which is included has to put into the fuse holder on the rear side (Figure 3: Fuse holder). Afterwards the battery is activated.

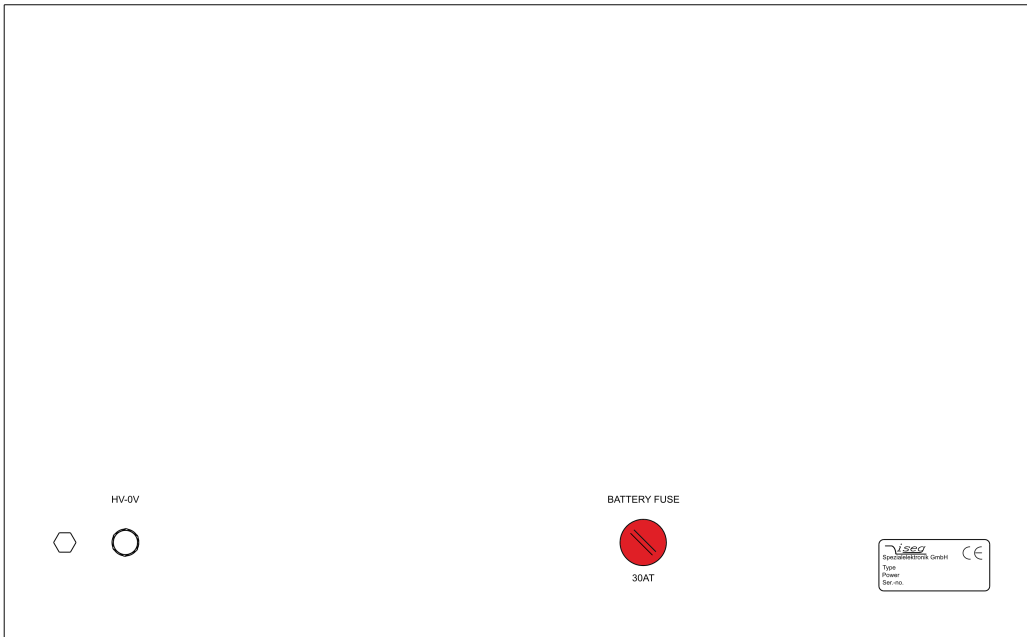


Figure 3: Fuse holder

6.3 Safety-Loop

INFORMATION



INFORMATION

Only for Modules with Option "SLP".

INFORMATION



INFORMATION

The safety loop feature has to be activated by removing a jumper (Figure 6: sample Jumper configuration on back side the high voltage Modules) on the backside of the high-voltage modules. See the specific module manual for more information. Check the compatibility with the devices used.

INFORMATION



INFORMATION

Make sure that the safety loop cable is well shielded. Use shielded twisted pair cables. Otherwise there may be interference (noise) on the high voltage.

2-pin Lemo socket (Figure 1: Front panel cutout) for Internal current, the accessories are in chapter 9 Accesories, one side connected to +24 V with ca. 10 Ω / 3 W, other side connected to module station. If the module safety loop of the built-in multichannel module with option SLP is active then an output voltage in any channel of it is only present if this safety loop is closed!

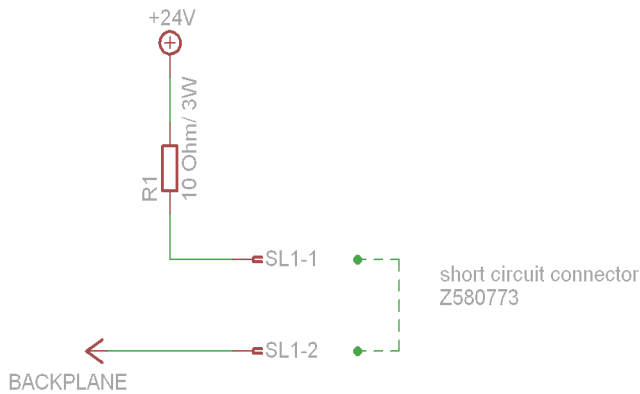


Figure 4: safety loop circuit

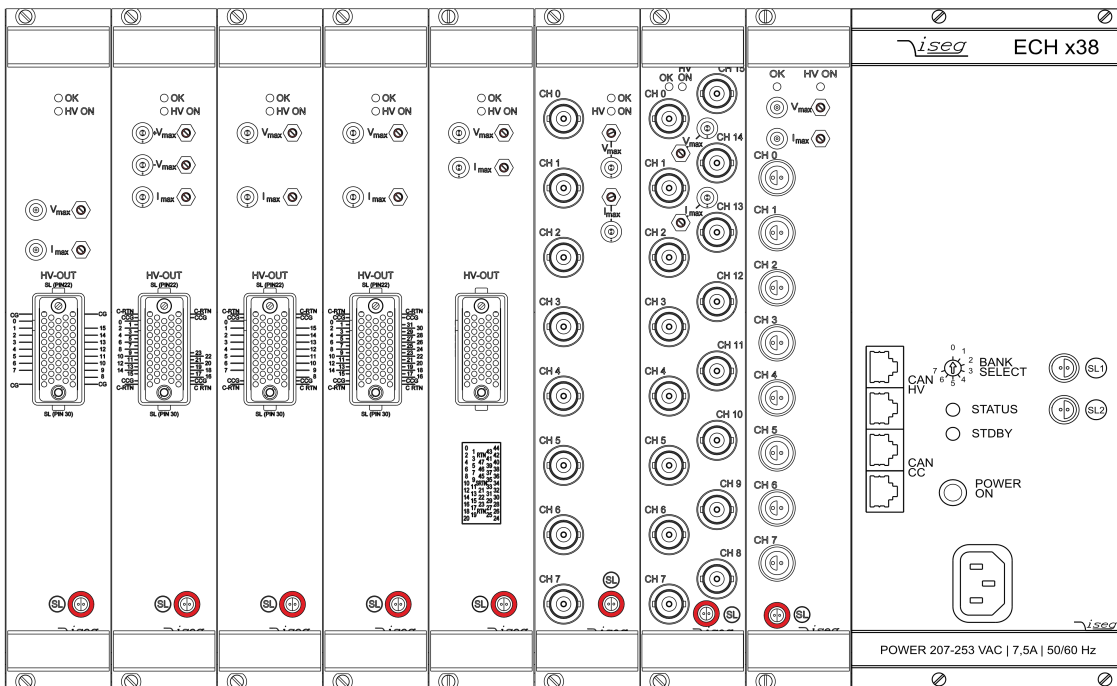


Figure 5: ECH 238 with HV modules



Figure 6: sample Jumper configuration on back side the high voltage Modules

6.4 SL2 – INHIBIT

INHIBIT 2-pin Lemo socket (Figure 1: Front panel cutout), the accessories are in chapter 9 Accessories, for external INHIBIT signal to shut down the integrated HV module with ramp. LOW level on the right pins or connecting to the left pins:

INHIBIT is active HIGH level or open: Output according setting

6.5 Status LEDs

LED	color	description
STATUS	green	POWER-ON (24V-DC is alright) and CAN has no error With Option UPS: Battery on float charge
STATUS	red	Error
STDBY	yellow	AC-supply ON With Option CAN: remote control possible

Table 6: Status LEDs

6.6 Bank select switch

The setting of the addresses of the iseg Multi-Channel HV modules is done by setting the address pins at the system connector. From these address pins the module gets the basic information to process the relating identifier bits. In the iseg system crate the address pins are set in same for all modules in the crate. It is set via a so called “Bank Select” switch at the front side of the crate controller.

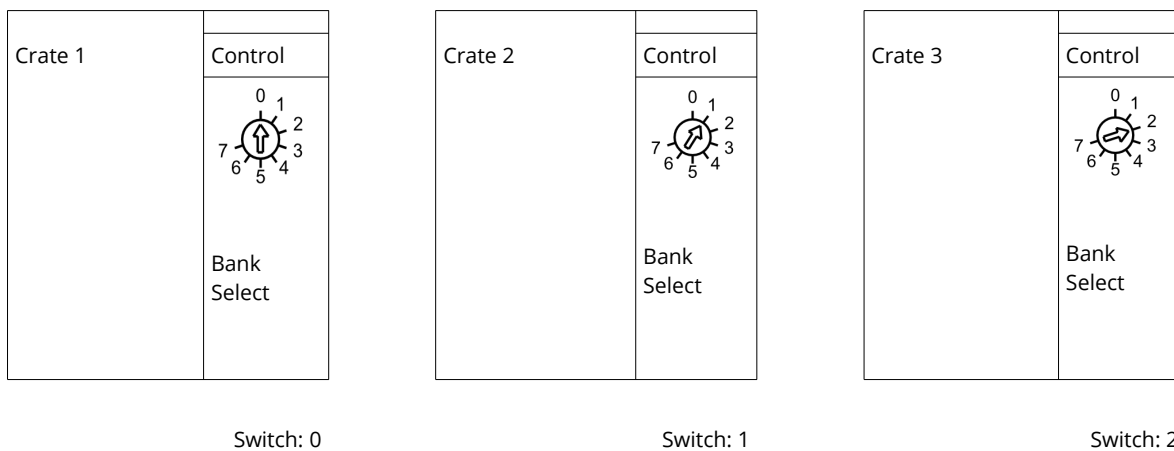


Figure 7: Example structure Crate

6.7 Forced air cooling

The crate offers an internal forced air cooling. The fresh air intake is on the bottom, for proper ventilation it needs to be sure that the airflow is not blocked.

CAUTION!



CAUTION!

The air inlet and outlet openings must not be covered or obstructed.

CAUTION!



CAUTION!

When installing the units, make sure that an air flow through the corresponding air inlet and outlet openings is possible.

INFORMATION



INFORMATION

Further it is recommended to cover unused module slots with blind front panels (see chapter 9 Accessories) to provide optimal airflow and cooling performance.

6.8 CAN-Interface

The CAN-control is completely configurable via software. After Power_ON-Reset the controller is running into CAN-Status "Initialization". During this state Write access is possible to all EEPROM-cells via the sub identifier. If control is already configured (e.g. from factory), control is running into CAN-status "Pre-operational". Only in these both states it is possible to work with services Network-Management (NMT) and Distribution-Management (DBT). CAN-Status "Pre-operational" is necessary for the further description. In order to allow the control of the crate via CAN-Bus, with global command „START“ the CAN-Status „Pre-operational“ will be switched into CAN-Status "Operational".

Services	ID	DLC	DATA_1
Network – Management (NMT)	(with RTR=0)		
START / STOP / RESET global broadcast message to all ECH CAN nodes	0	1	Bit 0 = 1 → Start Bit 1 = 1 → Stop Bit 2 = 1 → Reset CAN-interface Bit 3 = 1 → Reset Controller

Now control can work via two identifier:

- Subidentifier (Sub-ID)
- Control (EMCY-ID)

6.9 External CAN Bus

The CANbus interface will be connected by the RJ-45 (see 8 Connectors and PIN assignments) connectors CAN HV (IN/OUT) on the front panel. In case of using more than one crate the different module address for each module on the CANbus has to be configured with help of the bank select switch, see chapter 6.6 Bank select switch, on the front panel (Figure 1: Front panel cutout). After Switch ON and system initialization of CANbus the connected Multi Channel iseg HV-modules can work under remote control via PC.

INFORMATION	
	Please use a CAN-Bus termination.
INFORMATION	

7 Dimensional drawings

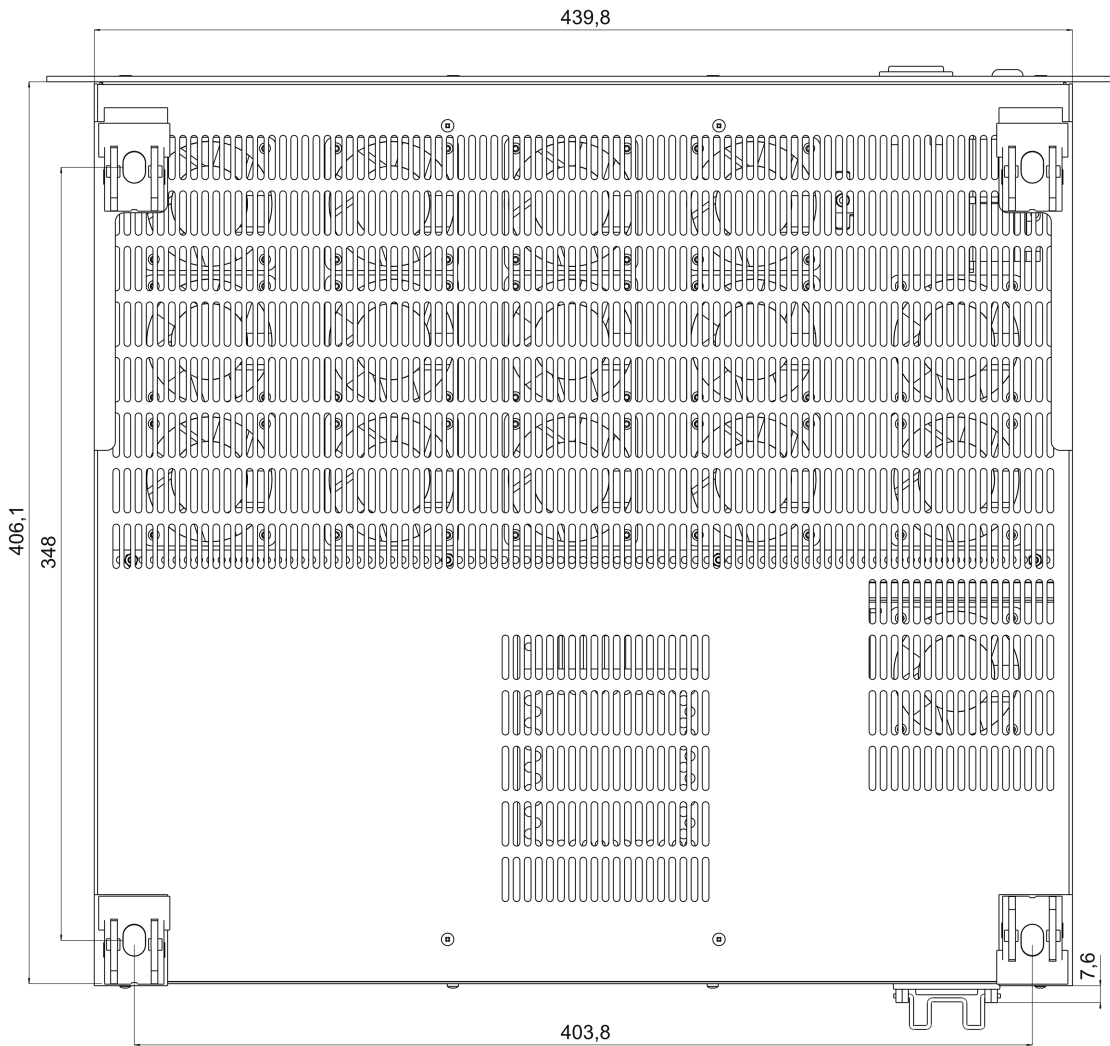


Figure 8: ECH 238, button view with Fan unit

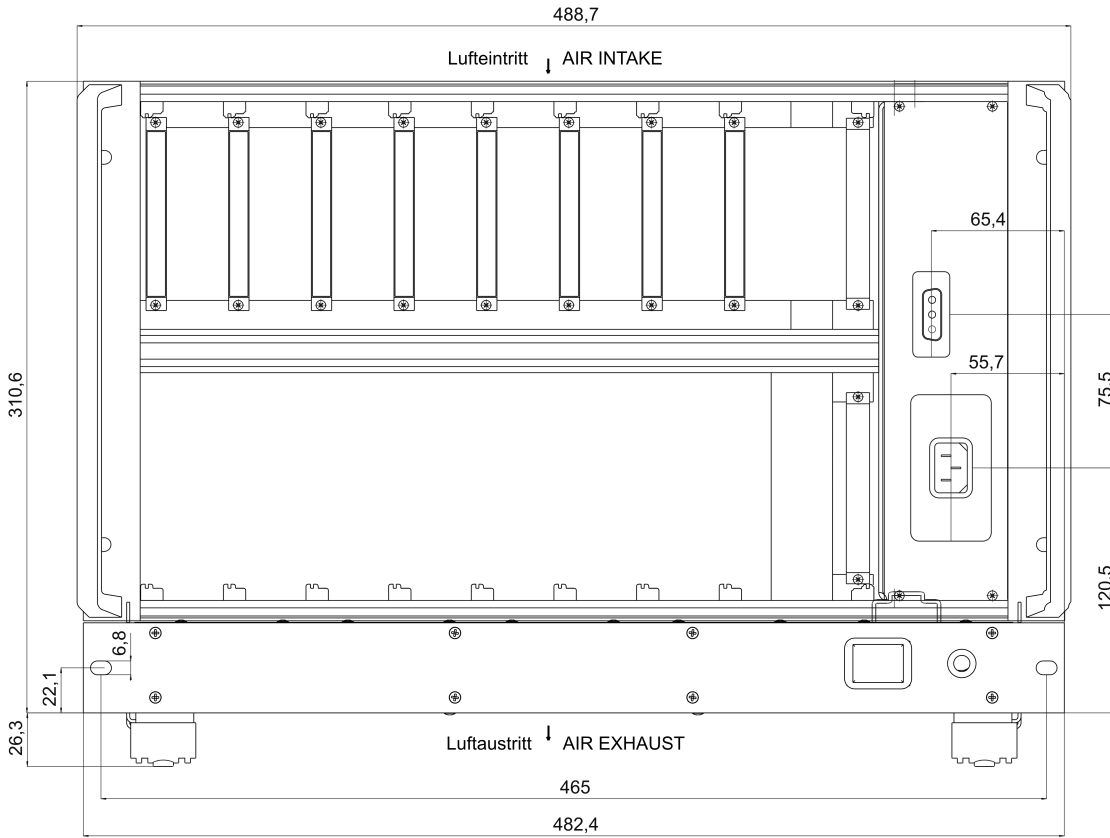


Figure 9: ECH 238, front view with Fan unit

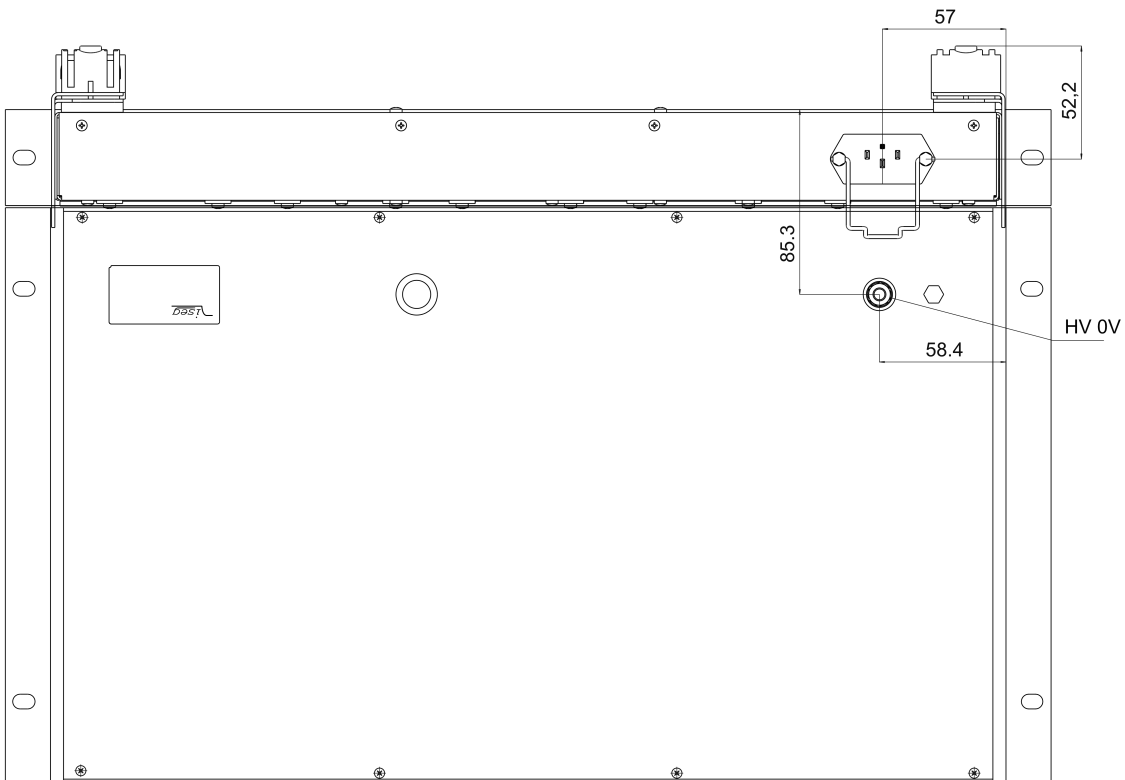


Figure 10: ECH 238, back view with Fan unit

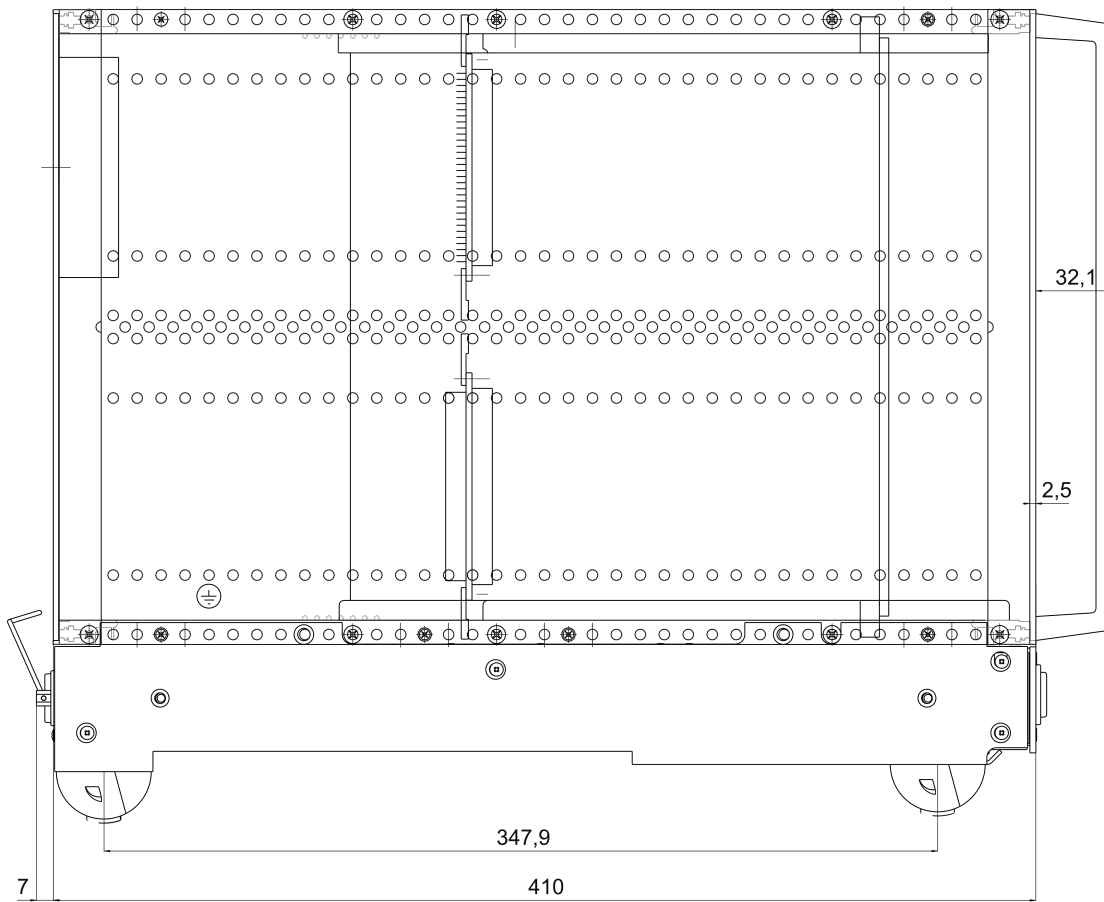


Figure 11: ECH 238, side view with Fan unit

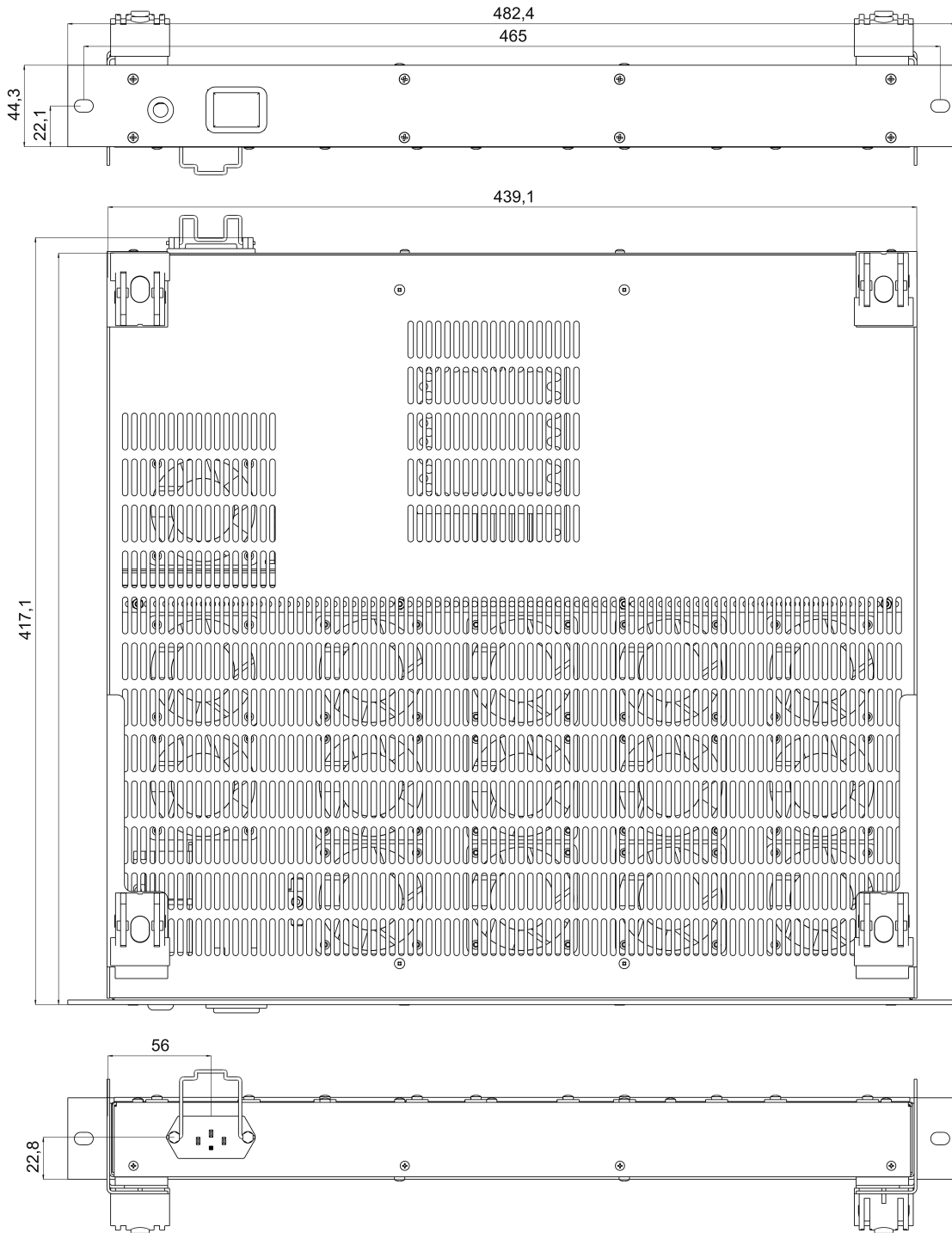


Figure 12: Fan unit

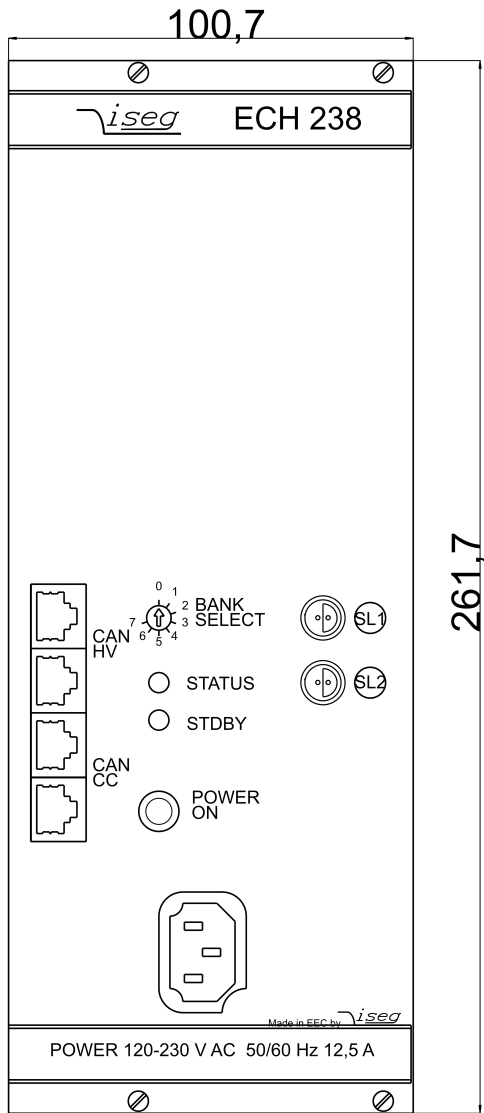

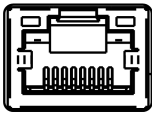


Figure 13: controller CC238

8 Connectors and PIN assignments

CONNECTORS – POWER SIDE		PART NUMBERS (manufacturer code / iseg accessory parts item code)	
Safety Loop socket		CABLE SIDE	
1 2 PIN  <i>Figure 14</i>	part number FFA.0S.302.CLAC manufacturer LEMO Elektronik GmbH iseg part number Z592312		
RJ45 (ETHERNET)		CABLE SIDE	
 <i>Figure 15</i>	connector RJ45 manufacturer various manufacturer iseg part number		

8.1 Safety Loop socket (SL1)

PIN	NAME	DESCRIPTION	VALUE
1	ILK	Interlock	
2	ILK	Interlock	

8.2 INHIBIT (SL2)

PIN	NAME	DESCRIPTION	VALUE
1	INH	Ramp Down	
2	GND	GND	

8.3 CAN HV / CAN CC (RJ45)

PIN	NAME	DESCRIPTION	VALUE
1	CAN_H	CAN high	
2	CAN_L	CAN low	
3	CAN_GND	CAN ground	

9 Accessories

CAUTION!



CAUTION!

Only use genuine iseg parts like power cables, CAN cables and terminators for stable and safe operation.

ACCESSORY ITEM	ORDER ITEM CODE
Short circuit connector (SL)	Z580773
AC power line cable	Z592069
Front panel (blind) RAL9001 6U/8HP	Z514569
CAN Termination RJ45, 120Ω	Z583380
CAN Adapters RJ45 to SUB-D-9 Connector	Z583382
CAN Adapters RJ45 to SUB-D-9 Socket (Z583401)	Z583401
Lemo connector 2-pole without collet (SL)	Z592312

Table 7: Accessory

10 Order guides

CONFIGURATION ORDER GUIDE (item code parts)						
G	2	3	8	122	000	00
Type	System height	System modules	Number of available inserts	Output Power	Option	Customized Version
Crate	2 = 6U (266,7mm)	3 = for MMS module For Example: EHS, EBS, ESS, EDS Modules	one significant digits. For Example: 8 = 8 Slot	two significant digits • exponent For Example: 122 = 12 • 10 ² [W] = 1200W	See chapter 3 Options	00 = none

Table 8: Order guides

11 Appendix

For more information please use the following download links:

This document

http://download.iseg-hv.com/SYSTEMS/MMS/ECH/iseg_manual_ECH_238_en.pdf

Manufacturers website (connectors)

LEMO Elektronik GmbH

<https://www.lemo.com/>

12 Warranty & Service

This device is made with high care and quality assurance methods. The standard factory warranty is 36 months. Please contact the iseg sales department if you wish to extend the warranty.

CAUTION!



CAUTION!

Repair and maintenance may only be performed by trained and authorized personnel.

For repair please follow the RMA instructions on our website: www.iseg-hv.com/en/support/rma

13 Disposal

INFORMATION



INFORMATION

All high-voltage equipment and integrated components are largely made of recyclable materials. Do not dispose the device with regular residual waste. Please use the recycling and disposal facilities for electrical and electronic equipment available in your country.

14 Battery

INFORMATION



Pb - Battery
contains lead

Batteries and rechargeable batteries do not dispose in regular residual waste. You are legally obliged to return used batteries and rechargeable batteries to a municipal collection point or to local retailers. Used batteries may contain harmful substances that can harm the environment or your health if not stored or disposed of properly.

15 Manufacturer contact

iseg Spezialelektronik GmbH

Bautzner Landstr. 23

01454 Radeberg / OT Rossendorf

GERMANY

FON: +49 351 26996-0 | FAX: +49 351 26996-21

www.iseg-hv.com | info@iseg-hv.de | sales@iseg-hv.de