High Voltage Power Supply EHQ F007n-F

16 floating channels with - 700 V / 4 mA each

controllable in voltage or current control mode

(Art. no.: EH160-07n405R51-K)

Operators Manual

Contents

Attention!

-The device must not be operated with the cover removed.

-We decline all responsibility for damages and injuries caused by an improper use of the module. It is highly recommended to read the manual before any kind of operation.

Note

The information in this manual is subject to change without notice. We take no responsibility for any error in the document. We reserve the right to make changes in the product design without reservation and without notification to the users.

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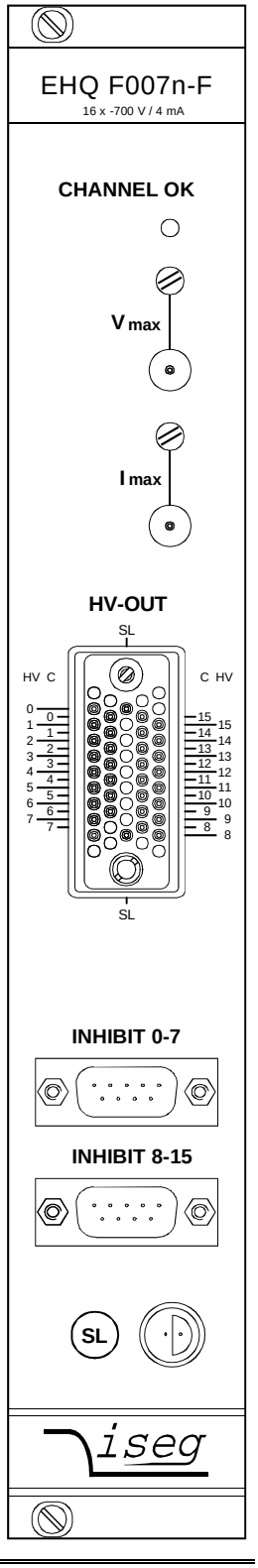
1. General information

The EHQ F007n_405-F is a 16-channel high voltage power supply in 6U Eurocard format. Each single channel is independently controllable in voltage or current control mode. The outputs HV-out positive - floating HV-GND - and HV-out negative of each channel are both floating against each other and against ground.
The 16-channel module is added at two 8-channel modules EHQ 8007n_405-F, which are controlled independently of each other.
The module is made ready for mounting into a crate or to supply separately with the necessary power.
The unit is software controlled via CAN Interface directly through a PC or similar controller with the commands for the **device class 7** according the attached manual for the CAN Interface.
The HV output at the EHQ F007n_405-F is equipped with a REDEL connector.



2. Technical data

16 channel HV module	**EHQ F007n_405 - F**								
Output current I_O	max. 4 mA								
Output voltage V_O	0 to 700 V								
Floating	Connector "C" (+) to GND: ≤ |20 V| Connector "HV" (-) to GND: ≤ |20 V| - V_O								
Ripple and noise	< 20 mV (at max. load and V_O > 50 V)								
Interface	CAN-Interface								
Voltage setting	Via software, resolution 14 mV								
Current setting	Via software, resolution 80 nA								
Voltage measurement	Via software, resolution 14 mV								
Current measurement	Via software, resolution 80 nA								
Accuracy of measurement (for one year)	Voltage: ± (0,01% ∗ V_O + 0,02% ∗ $V_{O\,max}$)								
	Current: ± (0,01% ∗ I_O + 0,01% ∗ $I_{O\,max}$)								
Temperature coefficient	< 5 ∗ $10^{-5}/_K$								
Stability	< 5 ∗ 10^{-5} (no load/load and Δ V_{IN})								
Rate of change of output voltage	Via software: 0,28 V/s to 70 V/s resolution 0,5 V								
Channel control via software	Status 8 bit: channel error, KILL- enable, channel emergency cut-off, ramp, channel on/off, input error, current trip								
16 channels error control via hardware limit	Current limit Voltage limit	("Channels 0-15 OK" is signalled if these limits do not exceed on each.)							
Error signal	Green LED at "Channels 0-15 OK"								
Protection loop (SL), 2 pin Lemo-socket	5 mA < I_s < 20 mA ⇒ module on I_s < 0,5 mA ⇒ module off								
INHIBIT per channel	About Sub-D-9 connectors INHIBIT (TTL level)								
INHIBIT 0-7 / Channel	0	1	2	3	4	5	6	7	GND
INHIBIT 8-15 / Channel	8	9	10	11	12	13	14	15	GND
Sub-D-9 connector / PIN	1	2	3	4	5	6	7	8	9
Power requirements V_{IN}	+ 24 V (< 3,5 A) and + 5 V (< 0,5 A)								
Packing	16-channels in 6U Euro cassette (w/d: 40,64 /220 mm)								
Connector	96-pin connector according to DIN 41612								
HV connector	REDEL connector equipped with 34 pins								

3. Handling

The supply voltages and the CAN interface is connected to the module via a 96-pin connector on the rear side of the module.

The maximum output current and voltage for all channels is defined through the position of the corresponding potentiometer I_{max} or V_{max} at the front panel. It is possible to measure the hardware current or voltage limit, which has been set with reference to the maximum possible current at the socket below. 100 % I_{max} or V_{max} corresponds to 2,5 V.
The output current and voltage will be limited to the setting value after it exceeds the threshold and the green LED on the front panel is 'OFF'.

If the HV channel should work in the current control mode (I_O according I_{SET} via software), the KILL function must be disable for this channel.

At the bottom on the right upper side of the front panel is the socket for the safety loop. If the safety loop is active then output voltage on all channels is only present if a current is flowing in a range of 5 to 20 mA of any polarity through the pins of this connector and the SL-contacts at the REDEL-connector (i.e. safety loop closed). If the safety loop is opened during operation then the output voltages are shut off without ramp and the corresponding bit in the 'Status module' will be cancelled. After the loop will be closed again the channels must be switched 'ON' and a new set voltage must be given before it is able to offer an output voltage. The pins of the loop are potential free, the internal voltage drop is ca. 3 V. Coming from the factory the safety loop is not active (the corresponding bit is always set). Removing of an internal jumper makes the loop active (s. App. A).

Additionally it is possible to install a INHIBIT for each channel (n= 0 to 15) via the Sub-D-9 connectors INHIBIT 0-7 and 8-15. If the INHIBIT contact pin (n) will be connected to the GND pin (or LOW potential) then the HV-PS on this channel will be switched off without ramp. The GND pins are internally connected to the module GND.

Attention: If this will be disconnected again (HIGH potential or open), then the HV will be set, according to the present V_{SET} , to V_{OUT} without ramp! Please shut the channel "OFF" or write V_{SET}= 0 before!

The connector HV-out positive - floating HV-GND - of each channel should be connected to ground at a certain chosen point. Otherwise it must be sure, that the potential between HV-out positive and GND should not exceed the amount of $|20\ V|$.

Pin assignment 96-pin connector according to DIN 41612:

PIN		PIN		PIN		Data
a1 a3 a5		b1 b3 b5		c1 c3 c5		+5V +24V GND
a11		b11		c11		@CAN_GND ⎫ @CANL ⎬ potential free @CANH ⎭
a13		b13				RESET OFF with ramp (e.g. 10s after power fail)
a30 a31 a32	A4 A2 A0	b30 b31 b32	A5 A3 A1	c30 c31 c32	GND GND GND	⎫ ⎬ Address field ⎭ module address (A0 ... A5)

The hardware signal "OFF with ramp" (Pulse High-Low-High, pulse width ≤ 100 µs) on pin b13 will be shut off the output voltage for all channels with a ramp analogue to the Group access "Channel ON/**OFF"**. The ramp speed is defined to V_{OUTmax} / 50 s. This is the actually module ramp speed after "OFF with ramp".
With help of the Group access "Channel **ON**/OFF**"** all channels are switched "ON" again.

With the address field a30/b30 ..... a32/b32 the module address will be coded.

Connected to GND ⇒ A(n) = 0 ; contact open ⇒ A(n) = 1