

Power Handle for imc CRONOSflex (CRFX/HANDLE-XXX)

The imc CRONOSflex Power Handle uses a DC/DC converter to generate a constant stabilized voltage of 50 V from an input voltage of 10 V to 50 V, which can be used to supply a large block of imc CRONOSflex modules. The converter does not only allow to supply very large systems safely, but also provides the Power-over EtherCAT (PoEC) capability. According to PoEC specification a minimum supply voltage of 42 V on the network line is required. This is ensured for the full 10 V to 50 V range.

The supply unit (power handle) is available in variants with additional UPS function, which ensures device function even during a supply failure. UPS units are available with either NiMH or Li-Ion batteries.

This additional supply unit ("Power Handle") is firmly connected mechanically to an imc CRONOSflex module or a module block by means of a robust click mechanism and supplies these via the bus system of the module connectors.



CRFX/HANDLE-LI-IO-L

Highlights

- Safely power a big number of imc CRONOSflex modules from a low DC voltage power source
- Makes a imc CRONOSflex system compatible with Power-over EtherCAT (PoEC) regardless of input voltage
- The Power Handle is available with UPS functionality (NiMH or Li-Ion batteries)
- UPS buffer time is configurable using a front panel switch
- Power Handle may also be used to directly power external satellite devices or modules or module blocks via 5 LEMO power connectors on the rear side of the unit (independent of the directly clicked block)
- Remote on/off control possible via switch or control signals ("REMOTE" socket)

imc CRONOSflex - Frameless expansion, flexible modularity

An imc CRONOSflex system is composed of a base unit and one or more imc CRONOSflex modules. These modules are designed to be directly connected to one another.

The imc Click Mechanism and extruded aluminum case provide a firm mechanical and electrical connection. As a result, no mainframe or rack is needed. Alternatively, connection can be made by means of standard Ethernet cables (RJ45, CAT5) thus creating a spatially distributed system. imc CRONOSflex Modules can be operated without the base unit when used as components within an EtherCAT-based automation system operating as EtherCAT slaves with full CANopen over EtherCAT (CoE) support.



imc Click Mechanism

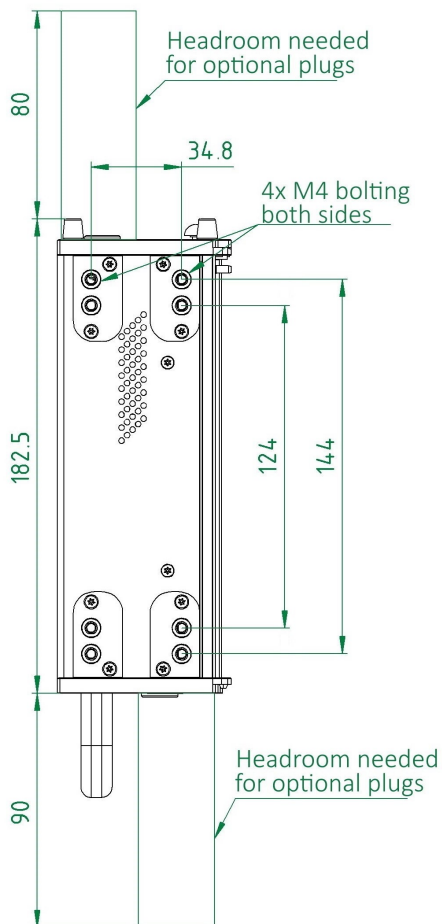
Overview of available variants

Standard version		ET version ¹	
Order code	article no	article no	
CRFX/HANDLE-POWER	11900058	11910045	left handle for imc CRONOSflex with a stabilized DC supply
CRFX/HANDLE-LI-IO-L	11900010	11910150	variant with UPS in Li-Ion technology
CRFX/HANDLE-UPS-NIMH-L	11900273	11910149	variant with UPS in NiMH technology
CRFX/HANDLE-L	11900008	-	passive handle left (without DC supply)
CRFX/HANDLE-R	11900007	-	passive handle right (without DC supply)
Discontinued:		article no	article no
CRFX/HANDLE-UPS-L	11900043	11910007	variant with UPS (lead gel) - obsolete

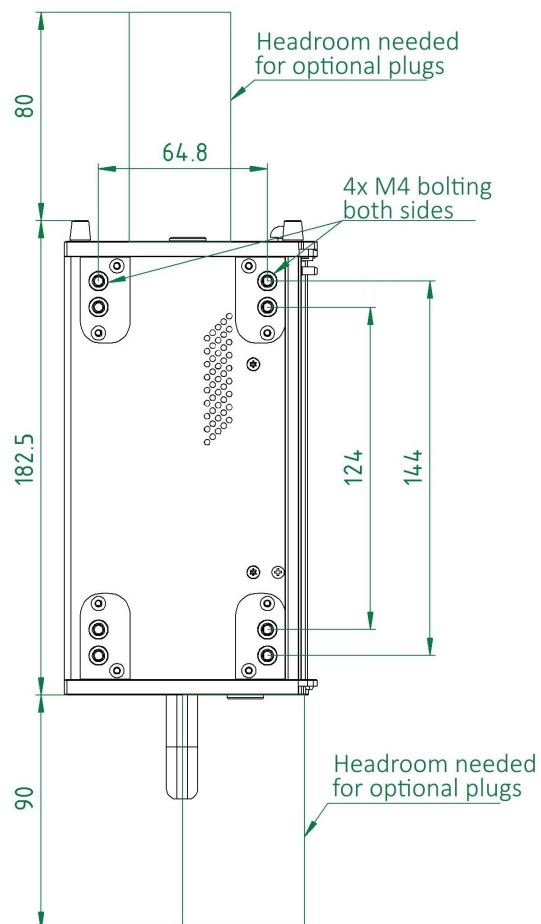
- (1) ET-Version of lead-gel type UPS does not differ from standard version in terms of operating temperature range, but with respect to allowable temporary condensation.

Mechanical drawings with dimensions

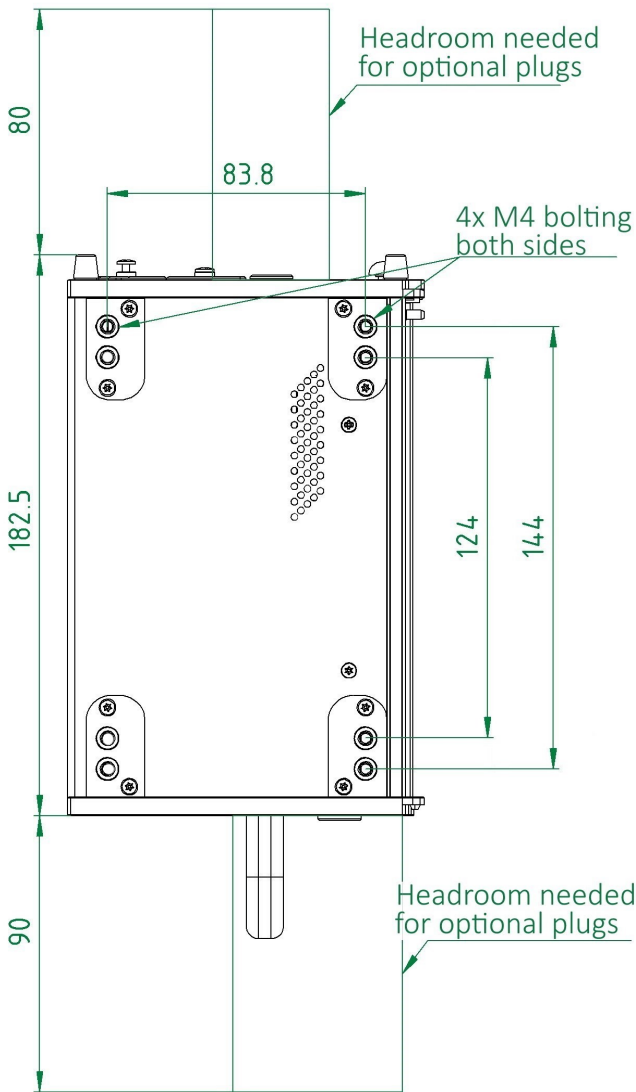
CRFX/HANDLE-POWER



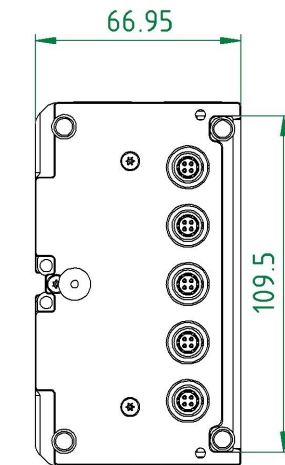
CRFX/HANDLE-NIMH-L



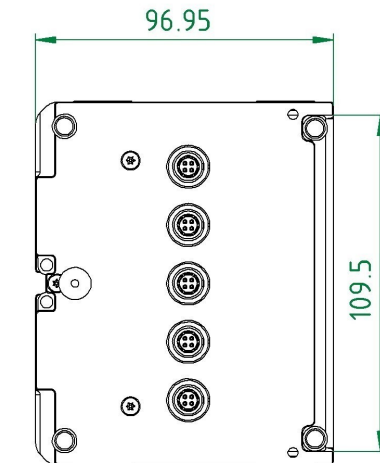
CRFX/HANDLE-LI-IO-L



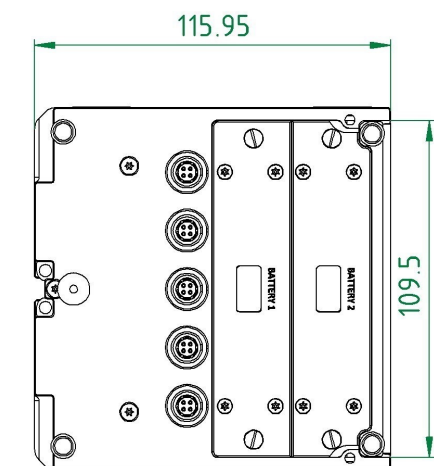
Rear side:



CRFX/HANDLE-POWER



CRFX/HANDLE-NIMH-L

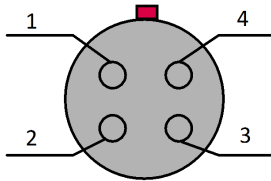


CRFX/HANDLE-LI-IO-L

POWER-HANDLE shown in standard operating orientation.

CRFX HANDLE POWER

additional output supply sockets: LEMO.1B.304



LEMO PIN	Supply
1	50 V
2	GND
3	reserved
4	reserved

Accessories and Connectors

Included accessories

for all variants

- Remote control plug LEMO.FGG.1B.306 13500153

only for UPS Li-Ion (CRFX/HANDLE-LI-IO-L)

- Li-Ion battery Battery set: 2x Li-Ion Smart Batteries 11900161
- Extraction handle Handle to remove the battery out of the unit

Optional accessories

AC/DC power adaptor 110-230 VAC 50-60 Hz (with appropriate LEMO.1B.302 plug)

- 48 V DC / 150 W ACC/AC-ADAP-48-150-1B 13500148

Power connectors

- ACC/POWER-PLUG-5 Power connector for DC supply LEMO FGE.1B.302 plug (male) (E-coded: 2 coding keys) 13500150
- CRFX/MODUL-PP-90 Power connector 90° angular LEMO.FHE.1B.302 plug (male) (E-coded: 2 coding keys) 11900074
- CRFX/HANDLE-PP-90 Auxiliary power output, 90° angular LEMO.FHG.1B.304 11900075

Mounting brackets for fixed installations

- CRFX/BRACKET-90 mounting bracket 90° 11900068
- CRFX/BRACKET-180 mounting bracket 180° 11900069
- CRFX/BRACKET-BACK rear panel mounting element 11900070
- CRFX/BRACKET-CON assembly element for 2 modules 11900071
- CRFX/RACK 19" RACK for imc CRONOSflex Modules 11900066
- CRFX/BRACKET-RACK mounting element in the RACK 11900072

Technical Specs - imc CRONOSflex Power Handle

POWER-HANDLE (CRFX/HANDLE-POWER)

Parameter	Value	Remarks
Input supply voltage	7 V to 50 V DC	
Shutdown-threshold (typ)	5.9 V	min. input voltage (no load)
Min. required input voltage for restart (typ.)	9.5 V	min. input voltage (no load)
Output voltage	50 V DC	constant, regulated over entire input range
Output power	100 W 70 W	10 V to 50 V DC input $V_{in} \cdot 10 A$
Output short circuit protection	continuous	
Isolation	isolated from CHASSIS, no input-to-output isolation	When connecting a CRFX base unit (with non-isolated supply input), the supply voltage is then grounded.
Power supply socket (input)	LEMO.EGE.1B.302 (female)	multicoded 2 keyways, compatible to plugs: LEMO.FGG.1B.302 (standard) LEMO.FGE.1B.302 (E-coded: 2 coding keys)
Remote control socket	LEMO.1B.306	
Auxiliary output power supply sockets	LEMO.1B.304	5 sockets for the supply of additional units and blocks that are not directly attached via module connector
UPS functionality	none	refer to NiMH or Li-Ion type UPS variant

UPS-NiMH (CRFX/HANDLE-UPS-NIMH-L)

Parameter	Value	Remarks
Input supply voltage	10 V to 50 V DC	
Shutdown-threshold (typ)	9.6 V	min. input voltage (no load)
Min. required input voltage for restart (typ.)	10.9 V	min. input voltage (no load)
Output voltage	50 V DC	constant, regulated over entire input range
Output power	100 W	10 V to 50 V DC input
Output short circuit protection	continuous	
Isolation	isolated from CHASSIS, no input-to-output isolation	When connecting a CRFX base unit (with non-isolated supply input), the supply voltage is then grounded.
Input supply terminal	LEMO.EGE.1B.302	multicoded 2 notches, compatible to connectors: LEMO.FGG.1B.302 (standard) LEMO.FGE.1B (E-coded: 2 coding keys)
Remote control terminal	LEMO.1B.306	
On/Off push button	✓ ¹	especially for use with imc EOS
Auxiliary output supply	LEMO.1B.304	5 terminals for the supply of additional units and blocks that are not directly attached via module connector
Weight	2.06 kg	
UPS battery type	NiMH	
UPS battery capacity	≥55 Wh	typ. 25°C, battery fully charged
UPS total buffering time	>30 min	typ. 25°C, depending on system size and configuration (rated for total system consumption of ≤100 W, gross input power)
UPS buffer time constant Selectable via manual switch	16 positions (0..9, A..F): 0s, 1s, 2s, 5s, 10s, 30s, 1min, 2min, 5min, 10min, 30min, 1h, 2h, 5h, 10h, maximum	maximum duration of a continuous outage before triggering device shutdown
Charging power	2.5 W (typ.)	device must be switched on
Duty cycle: charge time / discharge time	discharge time · 1.2 · (system power / 2.5 W)	worst case example: system power consumption 100 W buffer time 1 min., resulting recharge time ≤48 min. (duty cycle 48:1)
Charging time for complete battery recovery	36 h	

- (1) In connection with imc CRONOSflex, both the latching main switch on the CRFX base unit or the push button on the power handle can be used, both are "synchronized". In connection with imc EOS, the latching main switch is typically permanently pressed. The entire system is then switched on and off by the latching main switch on the power handle.

UPS-Li-Ion (CRFX/HANDLE-LI-IO-L)

Parameter	Value	Remarks
Input supply voltage	10 V to 50 V DC	
Shutdown-threshold (typ)	9.6 V	min. input voltage (no load)
Min. required input voltage for restart (typ.)	10.9 V	min. input voltage (no load)
Output voltage	50 V DC	constant, regulated over entire input range
Output power	100 W	10 V to 50 V DC input
Output short circuit protection	continuous	
Isolation	isolated from CHASSIS, no input-to-output isolation	When connecting a CRFX base unit (with non-isolated supply input), the supply voltage is then grounded.
Power supply socket (input)	LEMO.EGE.1B.302 (female)	multicoded 2 keyways, compatible to plugs: LEMO.FGG.1B.302 (standard) LEMO.FGE.1B.302 (E-coded: 2 coding keys)
Remote control socket	LEMO.1B.306	
On/Off push button	✓ ²	especially for use with imc EOS
Auxiliary output supply socket	LEMO.1B.304	5 sockets for the supply of additional units and blocks that are not directly attached via module connector
Weight	2.34 kg	
UPS battery type	2x Li-Ion Smart Battery	
UPS battery capacity	196 Wh ³	typ. 25°C, battery fully charged
UPS total buffering time	>1 h	typ. 25°C, depending on system size and configuration (rated for total system consumption of ≤100 W, gross input power)
UPS buffer time constant Selectable via manual switch	16 positions (0..9, A..F): 0s, 1s, 2s, 5s, 10s, 30s, 1min, 2min, 5min, 10min, 30min, 1h, 2h, 5h, 10h, maximum	maximum duration of a continuous outage before triggering device shutdown
Charging power	37 W (typ.)	device must be switched on temporarily higher charging power possible
Duty cycle: charge time / discharge time	discharge time · (system power / 37 W)	worst case example: system power consumption 100 W buffer time 1 min., resulting recharge time ≤3 min (duty cycle 3:1)
Charging time for complete battery recovery	6 h	

(2) As of delivery date approx. 2023, before that handle w/o On/Off push button

(3) As of delivery date FEB-2019, before that 138 Wh

Li-Ion Smart Battery		
Parameter	Value	Remarks
Charging time for complete battery recovery	3 h	device must be switched on
Capacity of each Li-ion battery	98 Wh ⁴	Nominal ratings at 21°C The available effective capacity depends on load and temperature. At temperatures below 0°C the usable capacity is reduced to a fraction of nominal values at 21°C. Example (at approx. 40 W load): approx. 85% at -10°C approx. 55% at -20°C
Operating temperature range		
Operation (discharge)	-20°C to +69°C	operational temperature range of UPS buffering functionality To protect the batteries at temperatures above 60°C the UPS buffer time constant is reduced to 15 seconds, regardless of configured setting
	-10°C to +50°C	specified temperature range as rated by Smart Battery manufacturer! Manufacturers of the individual Li-ion cells used in the Smart Battery, specify a discharging temperature range of -20°C to +60°C
	+75°C ± 5°C	battery disconnect: internal protection circuitry of the Smart Batteries prevent discharge
Charge	0°C to +45°C	above +45°C a charge of the batteries is inhibited (green charge level indicator LED stops flashing)
Storage	-20°C to +60°C	
Passive temperature fuse	+93°C (tolerance: +0°C, -5°C)	Once triggered, the passive temperature fuse cannot be reset thus irreversibly rendering the battery useless!
Relative Humidity	≤80%	

Note: Due to the inevitable leakage and self-discharge of the Smart Batteries we recommend a regular recharging cycle at least every 3 months that a device has not been in use (device must be switched on for charging).

(4) As of delivery date FEB-2019, before that 69 Wh