# imc NET-SWITCH-5

## 5-Port GBit Ethernet Switch with PTP synchronization supported


**BUSFX/NET-SWITCH-5**


**CRFX/NET-SWITCH-5**

The imc NET-SWITCH-5 is a PTP-capable Network-Switch integrated in a imc BUSDAQ*flex* (BUSFX) or imc CRONOS*flex* (CRFX) compatible housing (Click-mechanism and power supply).

### Highlights

- 5 Ethernet-Ports up to 1 GBit/s (1000BaseT)
- Supports PTP-Synchronization (Precision Time Protocol, IEEE 1588v2, end-to-end transparent clock)
- Synchronization of:
  - imc CRONOS*flex* (CRFX-2000GP)
  - imc CRONOS*compact* (CRC-400GP)
  - imc CRONOS-XT (CRXT-2000)
- Housing compatible for direct docking with CRFX and BUSFX devices
- Can be operated as Stand-Alone Switch
- 2-way redundant options for the power supply (10 to 50 V DC):
  - Module connector/locking slider
  - LEMO.0B respectively LEMO.1B with CRFX
- Compatible with imc UPS-system (battery buffering)
- Extended operating temperature range for industrial applications: -40 to +85°C

### Click-mechanism

- Modules joinable to module-blocks: mechanically and electrically connected (power supply)
- No tools or additional cabling required
- Switch is supplied from the "backbone power bus". Passive feed through of system bus
- Docking of switch on right hand side of the base unit, on arbitrary position within the entire system block.

### Docking with imc BUSDAQ*flex* (respectively imc CANSAS*flex*)

- With BUSFX/CANFX Click-connection: guide grooves, magnetic catches and locking slider
- Both short and long housing versions joinable, see different housing models 2
  with electrical connection: align on rear side
- CAN bus is fed through to downstream CANSAS modules ("backbone system bus")
- Note: imc BUSDAQ*flex* does not support PTP

### Docking with imc CRONOS*flex*

- With CRFX Click-connection
- EtherCAT bus is fed through to downstream imc CRONOS*flex* modules ("backbone system bus")
- Compatible with UPS extension for CRFX (battery buffered supply for entire system)

## Models and Options

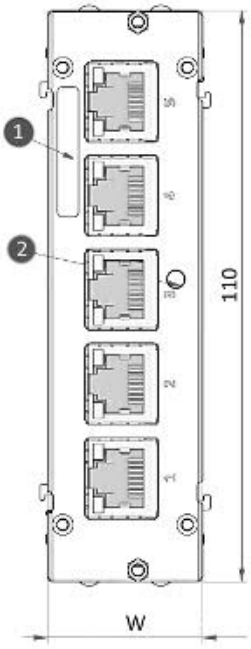
Overview of available variants for imc NET-SWITCH:

| Order Code | article no. | housing | properties |
|---|---|---|---|
| BUSFX/NET-SWITCH-5 | 1240027 | L0 | long housing (imc BUSDAQ*flex*) |
| ACC/NET-SWITCH-5 | 1350288 | S0 | short housing (imc CANSAS*flex*) |
| CRFX/NET-SWITCH-5 | 1190252 | GR1 | CRFX housing (imc CRONOS*flex)* |

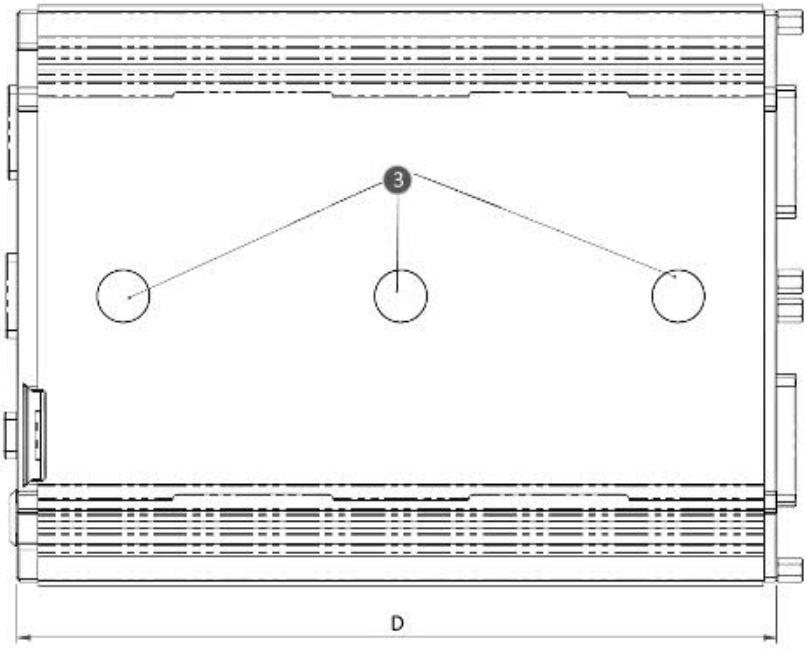
## Dimensions

L0 and S0 housing

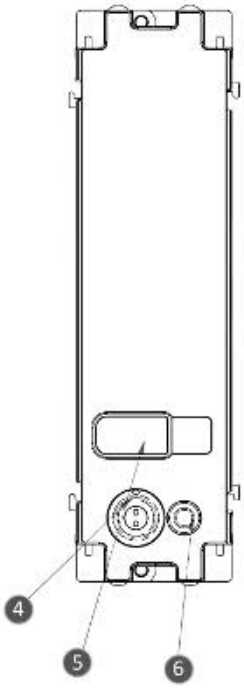
front




side view




rear view



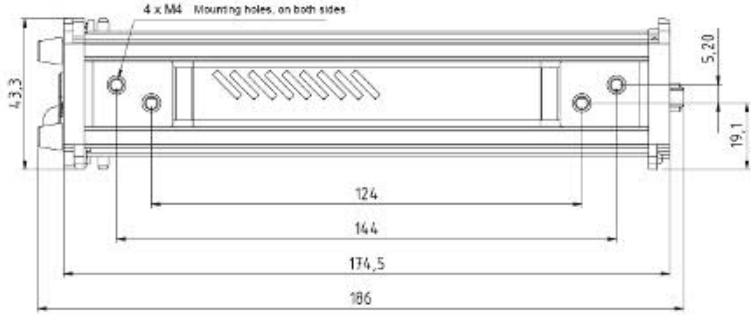

**Die Abbildung zeigt ein Modul in Standard-Gebrauchslage: Gehäusetyp L0 mit einer Breite (W) von 30 mm.**

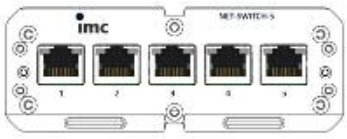
| Housing type | S0 | L0 |
|---|---|---|
| **W: Width** | 30 mm | 30 mm |
| **D: Depth** | 93 mm, with two magnets | 146.5 mm, with three magnets |

Legend:

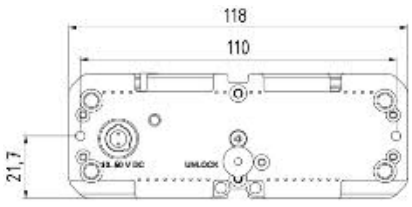
1: Serial number label
2: Status LED (blue / red)
3: magnet (depending on mode)
4: supply socket (LEMO)
5: locking slider CAN/supply
6: ground connection M3

CRFX housing (GR1)




front view: CRFX/NET-SWITCH-5




rear view

## Accessories and Connectors

### Included accessories

2x Ethernet network cable with latch protection (uncrossed, 2 m)

### Optional accessories (variant BUSFX/CANFX)

| **AC/DC power adaptor 110-230V AC (with appropriate LEMO.0B.302 plug)** | | |
|---|---|---|
| ACC/AC-ADAP-24-60-0B | 24 V DC, 60 W, LEMO.0B.302 | 1350246 |

| **Power connector** | | |
|---|---|---|
| ACC/POWER-PLUG3 | DC power connector LEMO FGG.0B.302, solder contact, max. 0.34 $mm^2$ | 1350033 |
| ACC/CABLE-LEMO-0B-BAN-2M5 | Power supply cable LEMO/banana 2.5 m | 1350276 |

| **Handles** | | |
|---|---|---|
| CANFX/HANDLE-S | CANFX handle kit (left and right) - short (S) | 1250027 |
| CANFX/HANDLE-L | CANFX handle kit (left and right) - long (L) | 1250028 |

| **Mounting brackets for DIN Rail** | | |
|---|---|---|
| CANFX/BRACKET-DIN-S0 | CANFX DIN Rail mounting bracket - Type S0 | 1250021 |
| CANFX/BRACKET-DIN-L0 | CANFX DIN Rail mounting bracket - Type L0 | 1250024 |

| **Mounting brackets for fixed installations** | | |
|---|---|---|
| CANFX/BRACKET-CON-S | CANFX connection bracket short | 1250019 |
| CANFX/BRACKET-CON-L | CANFX connection bracket long | 1250020 |

| **19" RACK** | | |
|---|---|---|
| CANFX/RACK | 19" Rack for L0 and S0 housing | 1250094 |

| **Miscellaneous** | | |
|---|---|---|
| CANFX/RUBBER-1M | silicone bumper strip blue 1 m | 1250029 |
| BUSFX/COVER-IP40 | protective cover on top of the locking slider in compliance with IP40 ingress protection class | 1240031 |

protective cover left (labeled with "L")

Set consisting of left and right protective cover

## Optional accessories (variant CRFX)

| AC/DC power adaptor 110-230V AC (with appropriate LEMO.1B.302 plug) | | article no. |
|---|---|---|
| 24 V DC / 60 W | CRPL/AC-ADAPTER-60W-1B | 1080066 |
| 24 V DC / 150 W | ACC/AC-ADAPTER-150W-1B | 1350139 |
| 48 V DC / 150 W | ACC/AC-ADAP-48-150-1B | 1350148 |

| Power connector | | |
|---|---|---|
| ACC/POWER-PLUG-5 | DC power connector<br>LEMO FGE.1B.302 (E-coded: 2 guiding notches) | 1350150 |
| CRFX/MODUL-PP-90 | DC power connector 90° angular<br>LEMO.FHE.1B.302 (E-coded: 2 guiding notches) | 1190074 |

| Supply module (Power Handle) | | |
|---|---|---|
| CRFX/HANDLE-POWER-L | Handle with system power supply<br>50 V 100 W, without UPS | 1190058 |
| CRFX/HANDLE-UPS-L | Handle with system power supply<br>50 V 100 W, UPS with lead-gel battery | 1190043 |
| CRFX/HANDLE-LI-IO-L | Handle with system power supply<br>50 V 100 W, UPS with Li-Ion battery | 1190010 |

| Handles | | |
|---|---|---|
| CRFX/HANDLE-L | passive CRFX handle, without power supply (left) | 1190008 |
| CRFX/HANDLE-R | passive CRFX handle, without power supply (right) | 1190007 |

| Mounting brackets for fixed installations | | |
|---|---|---|
| CRFX/BRACKET-90 | mounting bracket 90° | 1190068 |
| CRFX/BRACKET-180 | mounting bracket 180° | 1190069 |
| CRFX/BRACKET-BACK | rear panel mounting element | 1190070 |
| CRFX/BRACKET-CON | assembly element for 2 modules | 1190071 |

| 19" RACK | | |
|---|---|---|
| CRFX/RACK | 19" Rack for CRFX modules | 1190066 |
| CRFX/1/2-19" | 1/2 19" Rack for CRFX modules | 1190106 |

# Technical Specs imc NET-SWITCH-5

| Ports and operating modes | | |
|---|---|---|
| **Parameter** | **Value** | **Remarks** |
| Number of ports | 5 | identical properties |
| Transfer rate | 10 / 100 / 1000 Mbit/s | automatically |
| Modes | 10BASE-Te<br>100BASE-TX<br>1000BASE-T | IEEE 802.3 Clause 14,<br>requires Cat5 cabling<br>IEEE 802.3 Clause 25 (ex 802.3u)<br>IEEE 802.3 Clause 40 (ex 802.3ab) |
| Auto-Negotiation | active | priority 1: 1000BASE-T, full-duplex<br>priority 2: 1000BASE-T, half-duplex<br>priority 3: 100BASE-TX, full-duplex<br>priority 4: 100BASE-TX, half-duplex<br>priority 5: 10BASE-Te, full-duplex<br>priority 6: 10BASE-Te, half-duplex |
| Auto MDI/MDI-X | active | |
| Address table | 4 k entries | |
| Operating mode | store and forward | |
| MTU | 1500 Byte | |
| Accepted frame size | 64..1518(1522) Byte | smaller or larger packets are rejected |
| IEEE 1588v2 PTP clock configuration | E2E, TC, one-step | end-to-end transparent clock<br>compatible with two-step<br>no P2P (peer-to-peer) and no BC (boundary clock) |
| PTP Transport 1 | UDP IPv4 and IPv6, Ethernet | |
| PTP Transport 2 | multicast and unicast,<br>Ports 319 and 320 | multicast: messages are forwarded to all ports<br>unicast: messages are only forwarded to the port to which the recipient is connected |
| PTP domain | is not checked | |

| General | | | |
|---|---|---|---|
| **Parameter** | **Value** | | **Remarks** |
| Status LED | blue = on | | |
| Port LED | yellow (left) | green (right) | |
| | off | off | no connection |
| | on | off | 1000 Mbit/s connection, inaktive |
| | flashing | off | 1000 Mbit/s connection, aktive |
| | off | on | 100 Mbit/s connection, inaktive |
| | off | flashing | 100 Mbit/s connection, aktive |
| | on | on | 10 Mbit/s connection, inaktive |
| | flashing | flashing | 10 Mbit/s connection, aktive |

| Power supply | | | |
|---|---|---|---|
| **Parameter** | **Value typ.** | **min. / max.** | **Remarks** |
| Input supply voltage | 10 V to 50 V DC | | |
| Power consumption | | 4 W | |
| Module power supply options | power socket (LEMO) or adjacent module | | imc CRONOS*flex* or imc BUSDAQ*flex* imc CANSAS*flex* |

| **Terminal connection** (front) | **Value** | **Remarks** |
|---|---|---|
| LAN interface | 8P8C modular socket | RJ45 |
| Interfaces for power supply | • LEMO.0B or LEMO.1B with CRFX<br>• module connector/slider | suitable for setting up a redundant supply from 2 possible sources |

## Variant imc CRONOS*flex* (CRFX)

| **Terminal connections** (rear side of the CRFX module) | | |
|---|---|---|
| **Parameter** | **Value** | **Remarks** |
| Input supply plug (female) | LEMO.EGE.1B.302 | multicoded, 2-notch connector for optional individual power supply |
| Module connector | 2x 20 pin | system bus for distributed imc CRONOS*flex* components: EtherCAT not used by switch but fed through via module connector. Switch can be docked and inserted at arbitrary positions within the CRFX system (right hand side of base unit) |

| **Pass through power limits** | |
|---|---|
| Directly connected (clicked) imc CRONOS*flex* Modules | 3.1 A (maximum current)<br>Equivalent power with chosen DC power input:<br>• 149 W @ 48 V DC (e.g. AC/DC line adaptor)<br>• 74 W @ 24 V DC (e.g. AC/DC line adaptor)<br>• 37 W @ 12 V DC (typical vehicle supplied DC input) |

| **Operating conditions** | **Value** | **Remarks** |
|---|---|---|
| Ingress protection rating | IP20 | |
| Pollution degree | 2 | |
| Operating temperature | -40°C to +85°C | condensation temporarily allowed |
| Weight | 550 g | |

## Variant imc BUSDAQ*flex* (BUSFX, CANFX)

| **Terminal connections** (rear side of the module) | | |
|---|---|---|
| **Parameter** | **Value** | **Remarks** |
| Supply input | type: LEMO.0B (2-pin) | compatible with LEMO.EGE.0B.302<br>multicoded 2 notches<br>for optional individually power supply<br>compatible with connectors<br>FGG.0B.302 (Standard) or<br>FGE.0B.302 (E-coded, 48 V)<br>pin configuration: (1)+SUPPLY, (2)-SUPPLY |
| Module connector/locking slider | via locking slider<br>compatible with imc BUSDAQ*flex*<br>and/or imc CANSAS*flex* | Power supply of directly connected modules (BUSFX/CANFX Click-mechanism) without further cables.<br>CAN-Bus "Backbone" für imc CANSAS*flex* Systems: CAN not used by Switch but fed through via module connector. Switch can be docked and inserted at arbitrary positions within BUSFX/CANFX system |

| **Pass through power limits for directly connected modules (Click-mechanism)** | | |
|---|---|---|
| **Parameter** | **Value** | **Remarks** |
| Max. current | 8 A | at 25°C<br>current rating of the click connector |
| | -50 mA/K·$\Delta T_a$ | Derating with higher operating temperatures $T_a$,<br>$\Delta T_a = T_a - 25°C$ |
| Max. power | 96 W at 12 V DC<br>192 W at 24V DC | Equivalent pass through power<br>at 25°C<br>typ. DC vehicle voltage<br>AC/DC power adaptor and installations |
| | 60 W at 12 V DC<br>120 W at 24V DC | at +85°C |

| **Operating conditions** | | |
|---|---|---|
| **Parameter** | **Value** | **Remarks** |
| Ingress protection class | IP40 | only with optional protective cover (CANFX/COVER-IP40) on top of the locking slider, otherwise IP20 |
| Pollution degree | 2 | |
| Operating temperature range | -40°C to 85°C | internal condensation temporarily allowed |
| Weight | 410 g | |