

Data sheet PCF 1612

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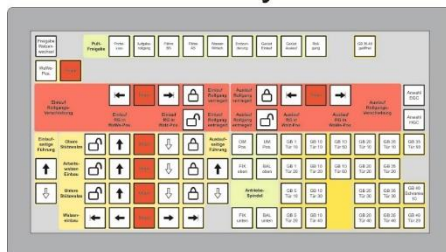
1. Device View and Overview

1.1 Product Range

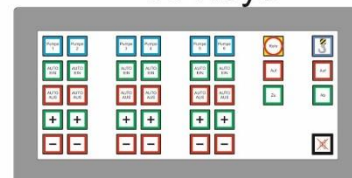
256 Keys



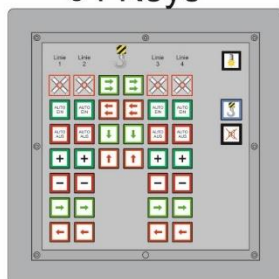
128 Keys



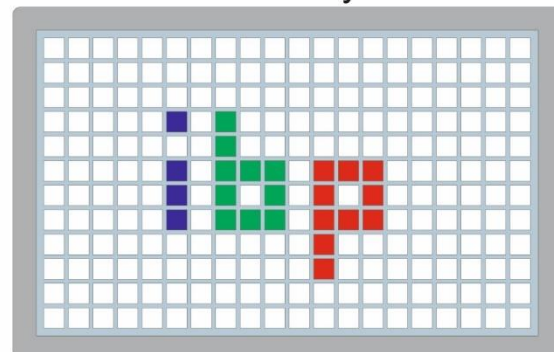
60 Keys



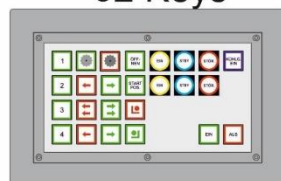
64 Keys



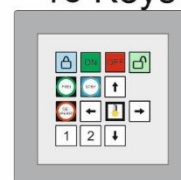
240 Keys



32 Keys



16 Keys

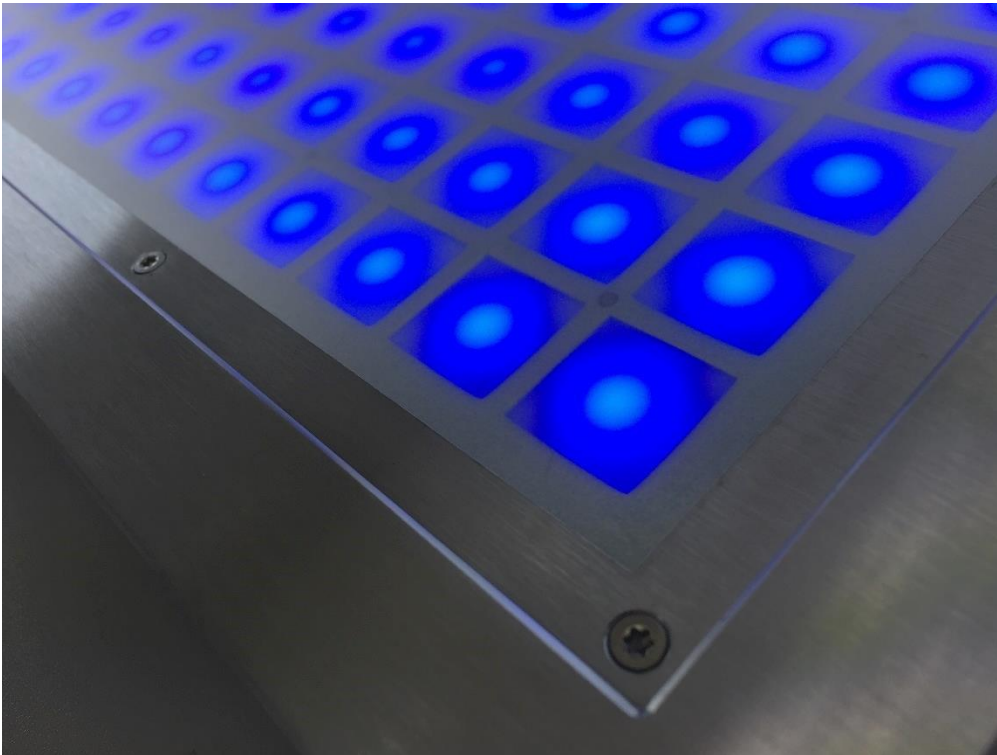


160 Keys



Overview of different devices

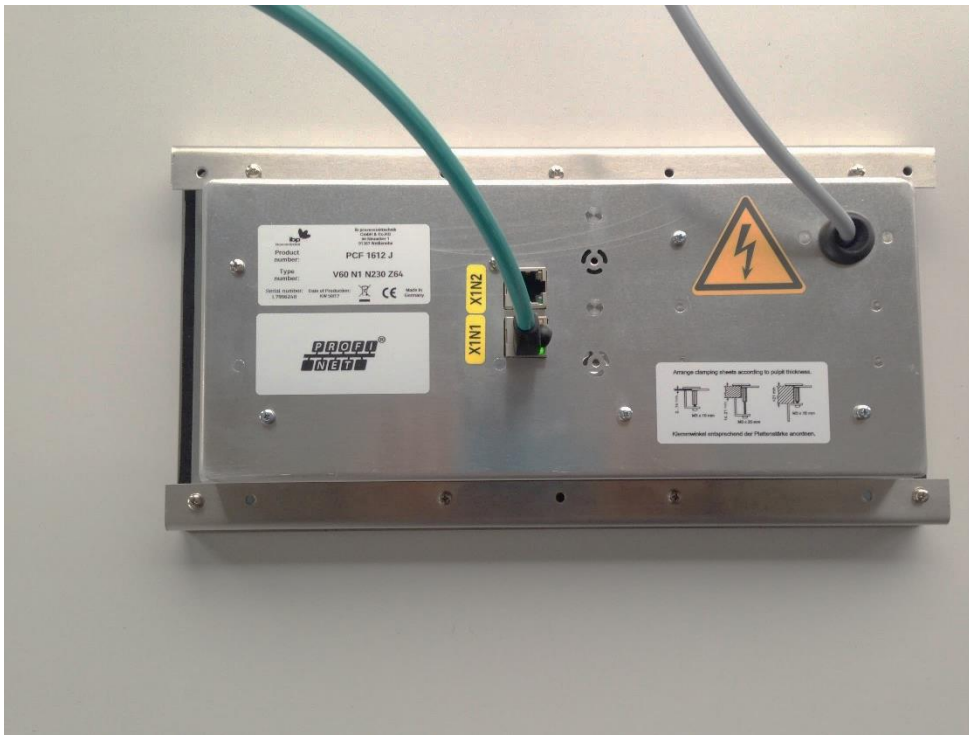
1.2 Device View



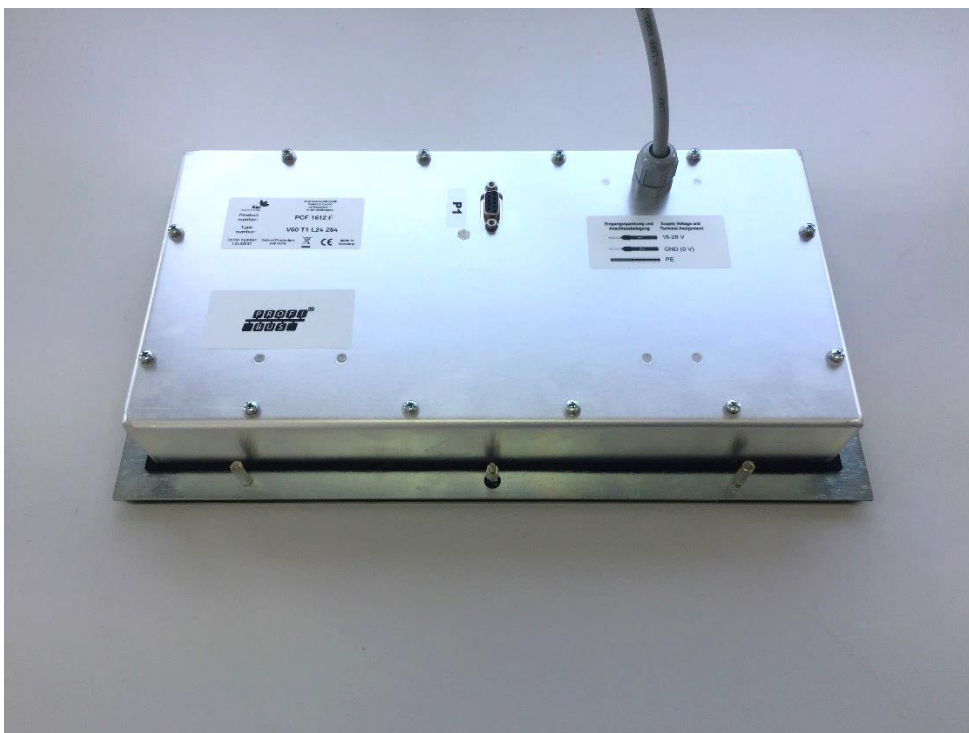
Operator Panel with 60 Keys and blue illumination



Operator Panel removed from the switch cabinet



Build-in Device with 60 Key build-in in a Pulpit



Operator Panel with 60 Keys build-in a switch cabinet

2. Characteristic Values

2.1 General Characteristic

Atmospherically Data

- Operating temperature 0...+50°C
- Storage temperature -20...+70°C
- Humidity 5% bis 95% non-condensing

Switching Matrix

- Key chamber (own product) ibpro20
- Switching cycles minimum 1.000.000
- Switching contacts 2 x 2
- Length of actuation path 0,25 mm
- Key camber aperture 20 x 20 mm²
- Distance from centre to centre 24 mm

Illuminable Cells

- Illuminable area 20 x 20 mm²
- Basic colour 1 green: 522 - 525 nm
- Basic colour 2 red: 620 - 622 nm
- Basic colour 3 blue: 467 – 470 nm
- Composite colour yellow
- Composite colour magenta
- Composite colour cyan
- Composite colour white

Foil Layers

- Key cover 1st transparent foil sticking to the mounting grid which intercepts the key
- Middle Layer Colour foil with project-specific inscriptions and graphical symbols
(a coloured foil will only be mounted, if explicitly ordered by the customer)
- Foil freezing and abrasion resistance 2nd transparent foil laid upon the colour foil to prevent it from mechanical abrasion and dazzling effects
- Fixing These foils which are arranged upon one another like the layers of a sandwich are covered and fixed by the overlaid inscription frame.
- Project-Specific Colour Foils Colour foils may be designed and printed by ibp on customer's demand.

Built-in Hooter 1

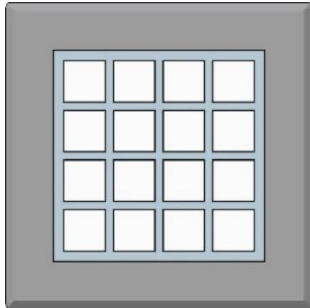
- Designation Beeper
- Frequency range 90 Hz ... 20 kHz
- Internal device usage Acoustical acknowledgement or refusal of key entries
- Control Sound and loudness can be controlled by PLC

Built-in Hooter 2

- Designation Beeper
- Frequency range 90 Hz ... 20 kHz
- Internal device usage Acoustical acknowledgement or refusal of key entries
- Control Sound and loudness can be controlled by PLC

2.2. Characteristic of Built-in Device

2.2.1 Built-in Device with 16 Keys



Dust and Humidity Protection

- In front of the key panel IP 54

Pulpit Opening

- Necessary spacing 135 x 135 mm²

Suspension Frame

- Outline 148 x 148 mm²
- Interior 102 x 102 mm²

Intrusion Depth

- Connectors fixed to the device maximally 110 mm

Weight

- Complete device 1,2 kg

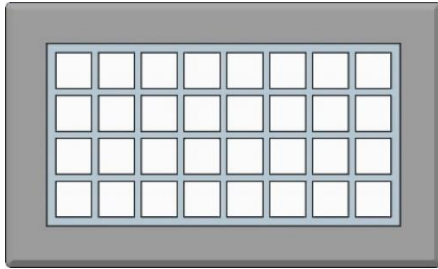
Connection with L24

- Input voltage range 18...28 V/DC
- Input voltage typically 24 V/DC
- Nominal power 9,3 W
- Awaited maximum power 9,3 W
(with full yellow illumination)
- Stand-by power, maximally 4,5 W

Connection with N230 and N110

- Input voltage range 85...264 V~
- Inrush current, maximally 45 A on 230 V~ and 25 A on 115V/AC
- Nominal power 10,2 W
- Awaited maximum power 9,3 W
(with full yellow illumination)
- Stand-by power, maximally 4,5 W

2.2.2 Built-in Device with 32 Keys



Dust and Humidity Protection

- In front of the key panel IP 54

Pulpit Opening

- Necessary spacing 231 x 135 mm²

Suspension Frame

- Outline 244 x 148 mm²
- Interior 198 x 102 mm²

Intrusion Depth

- Connectors fixed to the device maximally 110 mm

Weight

- Complete device 1,2 kg

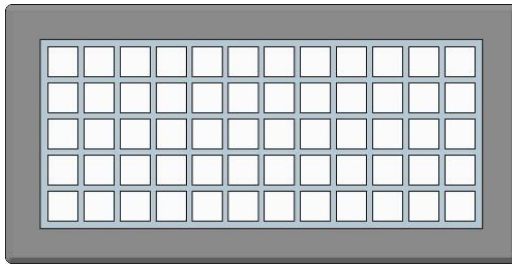
Connection with L24

- Input voltage range 18...28 V/DC
- Input voltage typically 24 V/DC
- Nominal power 14 W
- Awaited maximum power 14 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

Connection with N230 and N110

- Input voltage range 85...264 V~
- Inrush current, maximally 45 A on 230 V~ and 25 A on 115V/AC
- Nominal power 20 W
- Awaited maximum power 14 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

2.2.3 Built-in Device with 60 Keys



Dust and Humidity Protection

- In front of the key panel IP 54

Pulpit Opening

- Necessary spacing 327 x 159 mm²

Suspension Frame

- Outline 340 x 172 mm²
- Interior 294 x 126 mm²

Intrusion Depth

- Connectors fixed to the device maximally 110 mm

Weight

- Complete device 2,0 kg

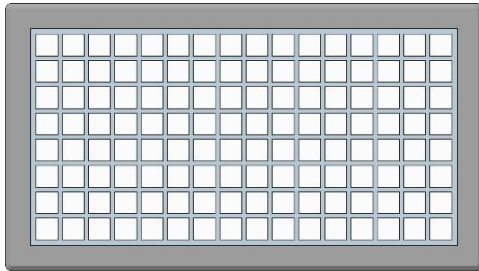
Connection with L24

- Input voltage range 18...28 V/DC
- Input voltage typically 24 V/DC
- Nominal power 20 W
- Awaited maximum power 20 W
(with full yellow illumination)
- Stand-by power, maximally 4,5 W

Connection with N230 and N110

- Input voltage range 85...264 V~
- Inrush current, maximally 45 A on 230 V~ and 25 A on 115V/AC
- Nominal power 30 W
- Awaited maximum power 20 W
(with full yellow illumination)
- Stand-by power, maximally 4,5 W

2.2.4 Built-in device with 128 Keys



Dust and Humidity Protection

- In front of the key panel IP 54

Pulpit Opening

- Necessary spacing 423 x 231 mm²

Suspension Frame

- Outline 436 x 231 mm²
- Interior 390 x 198 mm²

Intrusion Depth

- Connectors fixed to the device maximally 110 mm

Weight

- Complete device 3,0 kg

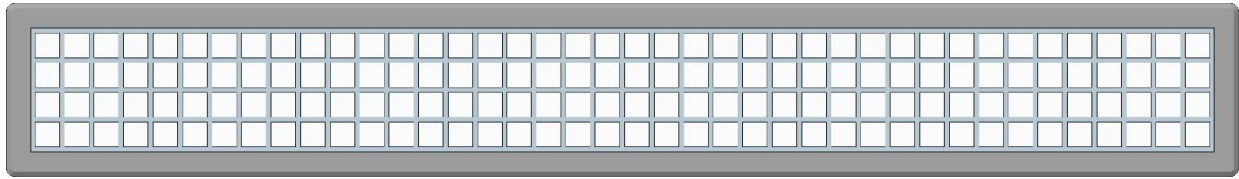
Connection with L24

- Input voltage range 18...28 V/DC
- Input voltage typically 24 V/DC
- Nominal power 42 W
- Awaited maximum power 42 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

Connection with N230 and N110

- Input voltage range 85...264 V~
- Inrush current, maximally 45 A on 230 V~ and 25 A on 115V/AC
- Nominal power 45 W
- Awaited maximum power 42 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

2.2.5 Built-in Device with 160 Keys



Dust and Humidity Protection

- In front of the key panel IP 54

Pulpit Opening

- Necessary spacing 998 x 135 mm²

Suspension Frame

- Outline 1012 x 148 mm²
- Interior 966 x 102 mm²

Intrusion Depth

- Connectors fixed to the device maximally 110 mm

Weight

- Complete device 3,8 kg

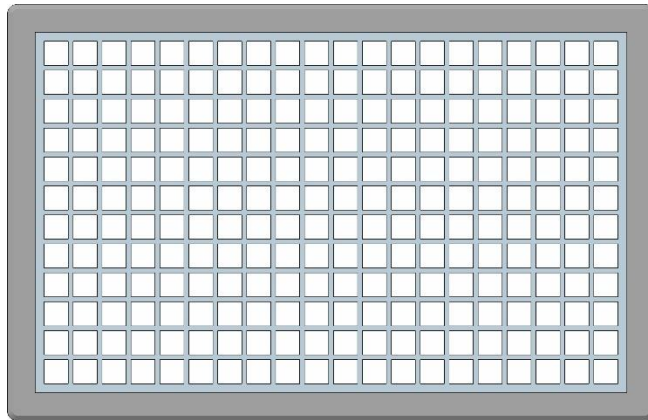
Connection with L24

- Input voltage range 18...28 V/DC
- Input voltage typically 24 V/DC
- Nominal power 50 W
- Awaited maximum power 50 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

Connection with N230 and N110

- Input voltage range 85...264 V~
- Inrush current, maximally 45 A on 230 V~ and 25 A on 115V/AC
- Nominal power 60 W
- Awaited maximum power 50 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

2.2.6 Built-in Device with 240 Keys



Dust and Humidity Protection

- In front of the key panel IP 54

Pulpit Opening

- Necessary spacing 519 x 327 mm²

Suspension Frame

- Outline 537 x 345 mm²
- Interior 491 x 299 mm²

Intrusion Depth

- Connectors fixed to the device maximally 110 mm

Weight

- Complete device 5 kg

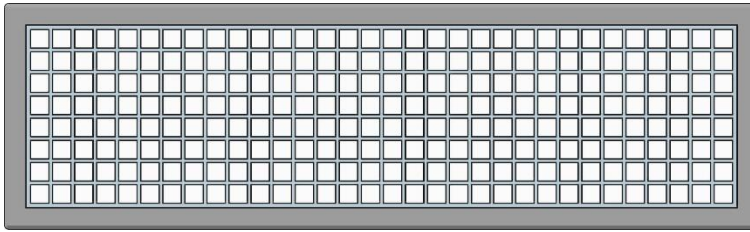
Connection with L24

- Input voltage range 18...28 V/DC
- Input voltage typically 24 V/DC
- Nominal power 75 W
- Awaited maximum power 75 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

Connection with N230 and N110

- Input voltage range 85...264 V~
- Inrush current, maximally 45 A on 230 V~ and 25 A on 115V/AC
- Nominal power 90 W
- Awaited maximum power 75 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

2.2.7 Built-in Device with 256 Keys



Dust and Humidity Protection

- In front of the key panel IP 54

Pulpit Opening

- Necessary spacing 807 x 231 mm²

Suspension Frame

- Outline 820 x 244 mm²
- Interior 774 x 198 mm²

Intrusion Depth

- Connectors fixed to the device maximally 110 mm

Weight

- Complete device 7 kg

Connection with L24

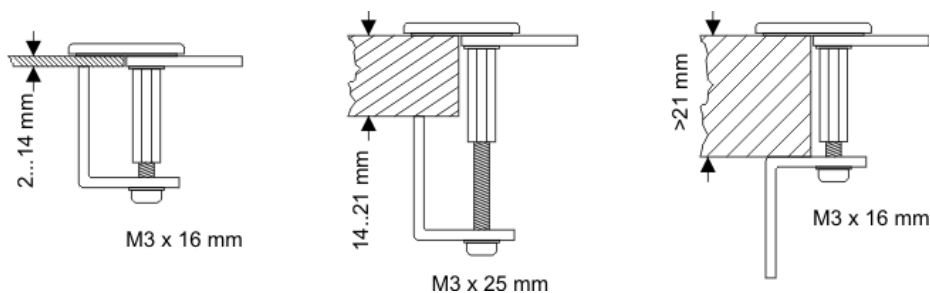
- Input voltage range 18...28 V/DC
- Input voltage typically 24 V/DC
- Nominal power 80 W
- Awaited maximum power 80 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

Connection with N230 and N110

- Input voltage range 85...264 V~
- Inrush current, maximally 45 A on 230 V~ and 25 A on 115V/AC
- Nominal power 90 W
- Awaited maximum power 80 W
- (with full yellow illumination)
- Stand-by power, maximally 4,5 W

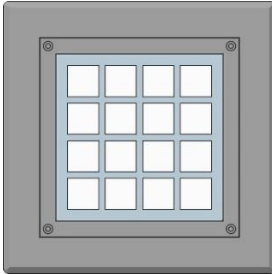
2.2.8 Mounting Procedure for Built-in Device

The built-in devices contain all accessories necessary for mounting on their cases. At delivery, the clamping sheets are turned to the front side that is to the suspension frame. They are fixed by an M3 x 16 mm screw set. This is the way; the keyboards are fixed on pulpit plates of small or middle thickness. Especially metal pulpits require this way of orientation. For thick wooden or plastic pulpit plates with a thickness of 21 or more millimetres, the orientation of the clamping sheets must be reversed. To prevent this mode of usage, the cable catcher contains a second set of screws with a length of M3 x 25 mm.



2.3. Characteristic of Operator Panel

2.3.1 Operator Panel with 16 Keys



Dust and Humidity Protection

- | | |
|---|---------------------|
| ▪ Front side inclusive of transition to tub | IP 65 |
| ▪ Rear side with M12-Socket | IP 54 |
| ▪ Rear side with D-Sub 9-Socket | IP 54 |
| ▪ Rear side with RJ-Socket | no water protection |

Key Panel

- | | |
|------------------------------|---------------------------|
| ▪ Mounting frame outline | 174 x 174 mm ² |
| ▪ Mounting frame interior | 128 x 128 mm ² |
| ▪ Inscription frame outline | 127 x 127 mm ² |
| ▪ Inscription frame interior | 107 x 107 mm ² |

Rectangular Aperture inside Locker Pulpit

- | | |
|----------------------------------|---------------------------|
| ▪ Necessary aperture | 128 x 128 mm ² |
| ▪ Presumed sheet metal thickness | 2... 3 mm |

Intrusion Depth

- | | |
|----------------------------------|------------------|
| ▪ Connectors fixed to the device | maximally 110 mm |
|----------------------------------|------------------|

Weight

- | | |
|-------------------|--------|
| ▪ Complete device | 1,4 kg |
|-------------------|--------|

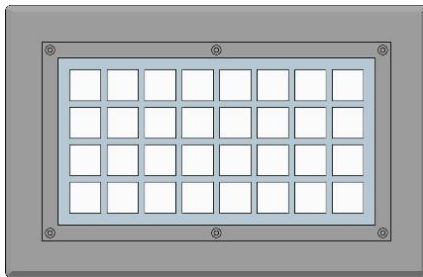
Connection with L24

- | | |
|---|--------------|
| ▪ Input voltage range | 18...28 V/DC |
| ▪ Input voltage typically | 24 V/DC |
| ▪ Nominal power | 9,3 W |
| ▪ Awaited maximum power (with full yellow illumination) | 9,3 W |
| ▪ Stand-by power, maximally | 4,5 W |

Connection with N230 and N110

- | | |
|---|------------------------------------|
| ▪ Input voltage range | 85...264 V~ |
| ▪ Inrush current, maximally | 45 A on 230 V~ and 25 A on 115V/AC |
| ▪ Nominal power | 10,2 W |
| ▪ Awaited maximum power (with full yellow illumination) | 9,3 W |
| ▪ Stand-by power, maximally | 4,5 W |

2.3.2 Operator Panel with 32 Keys



Dust and Humidity Protection

- | | |
|---|---------------------|
| ▪ Front side inclusive of transition to tub | IP 65 |
| ▪ Rear side with M12-Socket | IP 54 |
| ▪ Rear side with D-Sub 9-Socket | IP 54 |
| ▪ Rear side with RJ-Socket | no water protection |

Key Panel

- | | |
|------------------------------|---------------------------|
| ▪ Mounting frame outline | 270 x 174 mm ² |
| ▪ Mounting frame interior | 224 x 128 mm ² |
| ▪ Inscription frame outline | 223 x 127 mm ² |
| ▪ Inscription frame interior | 203 x 107 mm ² |

Rectangular Aperture inside Locker Pulpit

- | | |
|----------------------------------|---------------------------|
| ▪ Necessary aperture | 224 x 128 mm ² |
| ▪ Presumed sheet metal thickness | 2... 3 mm |

Intrusion Depth

- | | |
|----------------------------------|------------------|
| ▪ Connectors fixed to the device | maximally 110 mm |
|----------------------------------|------------------|

Weight

- | | |
|-------------------|--------|
| ▪ Complete device | 1,8 kg |
|-------------------|--------|

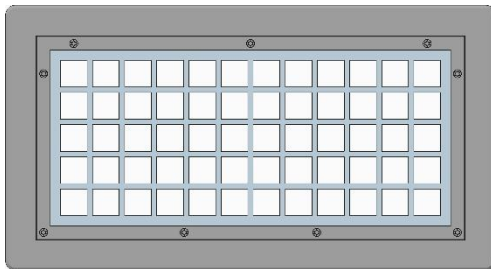
Connection with L24

- | | |
|--|--------------|
| ▪ Input voltage range | 18...28 V/DC |
| ▪ Input voltage typically | 24 V/DC |
| ▪ Nominal power | 14 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 14 W |
| ▪ Stand-by power, maximally | 4,5 W |

Connection with N230 and N110

- | | |
|--|------------------------------------|
| ▪ Input voltage range | 85...264 V~ |
| ▪ Inrush current, maximally | 45 A on 230 V~ and 25 A on 115V/AC |
| ▪ Nominal power | 20 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 14 W |
| ▪ Stand-by power, maximally | 4,5 W |

2.3.3 Operator Panel with 60 Keys



Dust and Humidity Protection

- | | |
|---|---------------------|
| ▪ Front side inclusive of transition to tub | IP 65 |
| ▪ Rear side with M12-Socket | IP 54 |
| ▪ Rear side with D-Sub 9-Socket | IP 54 |
| ▪ Rear side with RJ-Socket | no water protection |

Key Panel

- | | |
|------------------------------|---------------------------|
| ▪ Mounting frame outline | 366 x 198 mm ² |
| ▪ Mounting frame interior | 320 x 152 mm ² |
| ▪ Inscription frame outline | 319 x 151 mm ² |
| ▪ Inscription frame interior | 299 x 131 mm ² |

Rectangular Aperture inside Locker Pulpit

- | | |
|----------------------------------|---------------------------|
| ▪ Necessary aperture | 320 x 152 mm ² |
| ▪ Presumed sheet metal thickness | 2... 3 mm |

Intrusion Depth

- | | |
|----------------------------------|------------------|
| ▪ Connectors fixed to the device | maximally 110 mm |
|----------------------------------|------------------|

Weight

- | | |
|-------------------|--------|
| ▪ Complete device | 2,8 kg |
|-------------------|--------|

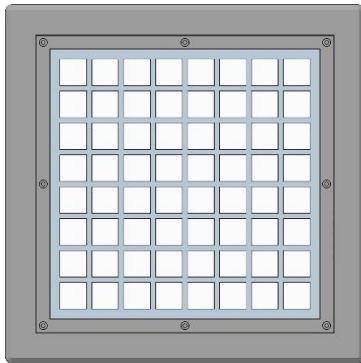
Connection with L24

- | | |
|--|--------------|
| ▪ Input voltage range | 18...28 V/DC |
| ▪ Input voltage typically | 24 V/DC |
| ▪ Nominal power | 20 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 20 W |
| ▪ Stand-by power, maximally | 4,5 W |

Connection with N230 and N110

- | | |
|--|------------------------------------|
| ▪ Input voltage range | 85...264 V~ |
| ▪ Inrush current, maximally | 45 A on 230 V~ and 25 A on 115V/AC |
| ▪ Nominal power | 30 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 20 W |
| ▪ Stand-by power, maximally | 4,5 W |

2.3.4 Operator Panel with 64 Keys



Dust and Humidity Protection

- | | |
|---|---------------------|
| ▪ Front side inclusive of transition to tub | IP 65 |
| ▪ Rear side with M12-Socket | IP 54 |
| ▪ Rear side with D-Sub 9-Socket | IP 54 |
| ▪ Rear side with RJ-Socket | no water protection |

Key Panel

- | | |
|------------------------------|---------------------------|
| ▪ Mounting frame outline | 270 x 270 mm ² |
| ▪ Mounting frame interior | 224 x 224 mm ² |
| ▪ Inscription frame outline | 223 x 223 mm ² |
| ▪ Inscription frame interior | 203 x 203 mm ² |

Rectangular Aperture inside Locker Pulpit

- | | |
|----------------------------------|---------------------------|
| ▪ Necessary aperture | 224 x 224 mm ² |
| ▪ Presumed sheet metal thickness | 2... 3 mm |

Intrusion Depth

- | | |
|----------------------------------|------------------|
| ▪ Connectors fixed to the device | maximally 110 mm |
|----------------------------------|------------------|

Weight

- | | |
|-------------------|--------|
| ▪ Complete device | 3,0 kg |
|-------------------|--------|

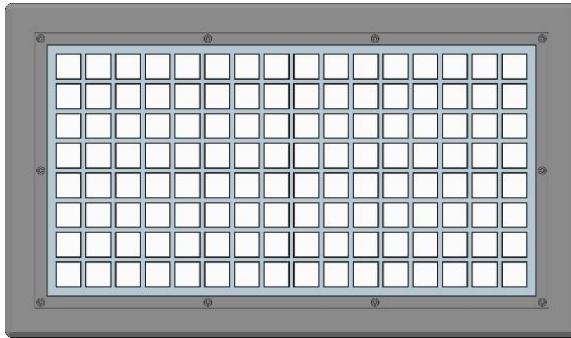
Connection with L24

- | | |
|--|--------------|
| ▪ Input voltage range | 18...28 V/DC |
| ▪ Input voltage typically | 24 V/DC |
| ▪ Nominal power | 21 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 21 W |
| ▪ Stand-by power, maximally | 4,5 W |

Connection with N230 and N110

- | | |
|--|------------------------------------|
| ▪ Input voltage range | 85...264 V~ |
| ▪ Inrush current, maximally | 45 A on 230 V~ and 25 A on 115V/AC |
| ▪ Nominal power | 30 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 21 W |
| ▪ Stand-by power, maximally | 4,5 W |

2.3.5 Operator Panel with 128 Keys



Dust and Humidity Protection

- | | |
|---|---------------------|
| ▪ Front side inclusive of transition to tub | IP 65 |
| ▪ Rear side with M12-Socket | IP 54 |
| ▪ Rear side with D-Sub 9-Socket | IP 54 |
| ▪ Rear side with RJ-Socket | no water protection |

Key Panel

- | | |
|------------------------------|---------------------------|
| ▪ Mounting frame outline | 462 x 270 mm ² |
| ▪ Mounting frame interior | 416 x 224 mm ² |
| ▪ Inscription frame outline | 415 x 223 mm ² |
| ▪ Inscription frame interior | 395 x 203 mm ² |

Rectangular Aperture inside Locker Pulpit

- | | |
|----------------------------------|---------------------------|
| ▪ Necessary aperture | 416 x 224 mm ² |
| ▪ Presumed sheet metal thickness | 2... 3 mm |

Intrusion Depth

- | | |
|----------------------------------|------------------|
| ▪ Connectors fixed to the device | maximally 110 mm |
|----------------------------------|------------------|

Weight

- | | |
|-------------------|--------|
| ▪ Complete device | 3,6 kg |
|-------------------|--------|

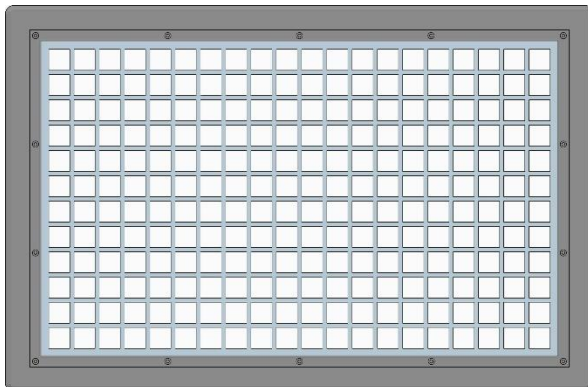
Connection with L24

- | | |
|--|--------------|
| ▪ Input voltage range | 18...28 V/DC |
| ▪ Input voltage typically | 24 V/DC |
| ▪ Nominal power | 50 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 50 W |
| ▪ Stand-by power, maximally | 4,5 W |

Connection with N230 and N110

- | | |
|--|------------------------------------|
| ▪ Input voltage range | 85...264 V~ |
| ▪ Inrush current, maximally | 45 A on 230 V~ and 25 A on 115V/AC |
| ▪ Nominal power | 60 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 50 W |
| ▪ Stand-by power, maximally | 4,5 W |

2.3.6 Operator Panel with 240 Keys



Dust and Humidity Protection

- | | |
|---|---------------------|
| ▪ Front side inclusive of transition to tub | IP 65 |
| ▪ Rear side with M12-Socket | IP 54 |
| ▪ Rear side with D-Sub 9-Socket | IP 54 |
| ▪ Rear side with RJ-Socket | no water protection |

Key Panel

- | | |
|------------------------------|---------------------------|
| ▪ Mounting frame outline | 558 x 366 mm ² |
| ▪ Mounting frame interior | 512 x 320 mm ² |
| ▪ Inscription frame outline | 511 x 319 mm ² |
| ▪ Inscription frame interior | 491 x 299 mm ² |

Rectangular Aperture inside Locker Pulpit

- | | |
|----------------------------------|---------------------------|
| ▪ Necessary aperture | 512 x 320 mm ² |
| ▪ Presumed sheet metal thickness | 2... 3 mm |

Intrusion Depth

- | | |
|----------------------------------|------------------|
| ▪ Connectors fixed to the device | maximally 110 mm |
|----------------------------------|------------------|

Weight

- | | |
|-------------------|--------|
| ▪ Complete device | 5,7 kg |
|-------------------|--------|

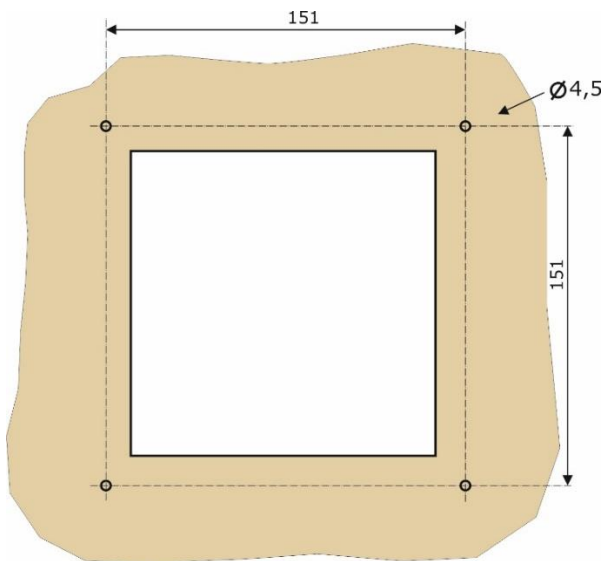
Connection with L24

- | | |
|--|--------------|
| ▪ Input voltage range | 18...28 V/DC |
| ▪ Input voltage typically | 24 V/DC |
| ▪ Nominal power | 75 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 75 W |
| ▪ Stand-by power, maximally | 4,5 W |

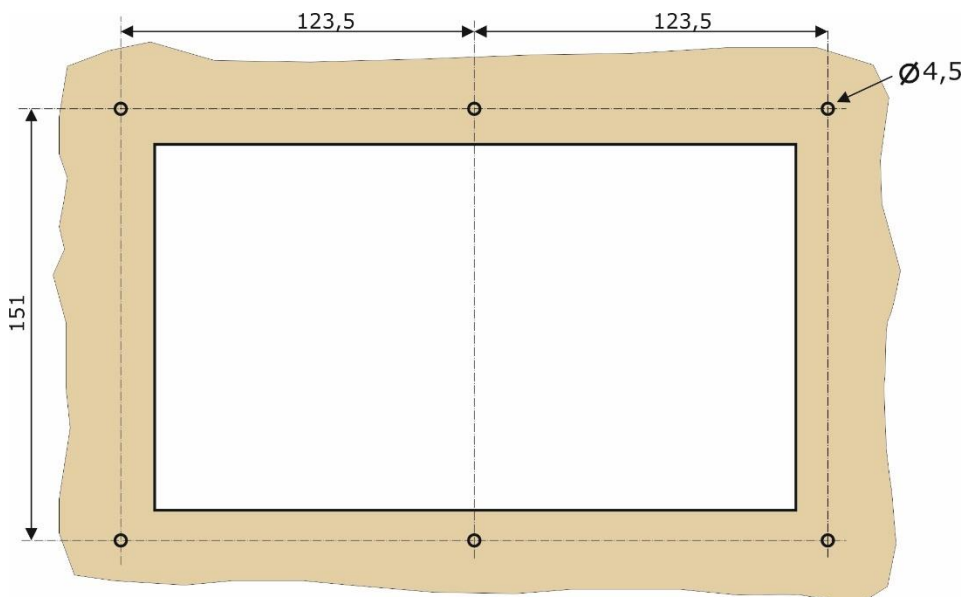
Connection with N230 and N110

- | | |
|--|------------------------------------|
| ▪ Input voltage range | 85...264 V~ |
| ▪ Inrush current, maximally | 45 A on 230 V~ and 25 A on 115V/AC |
| ▪ Nominal power | 90 W |
| ▪ Awaited maximum power
(with full yellow illumination) | 75 W |
| ▪ Stand-by power, maximally | 4,5 W |

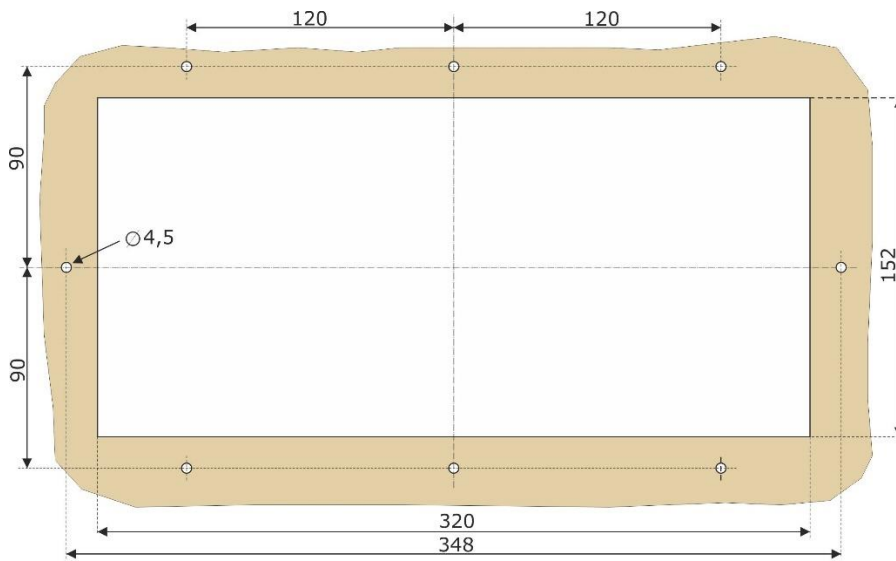
2.3.8 Position of the holes for Operator Panel



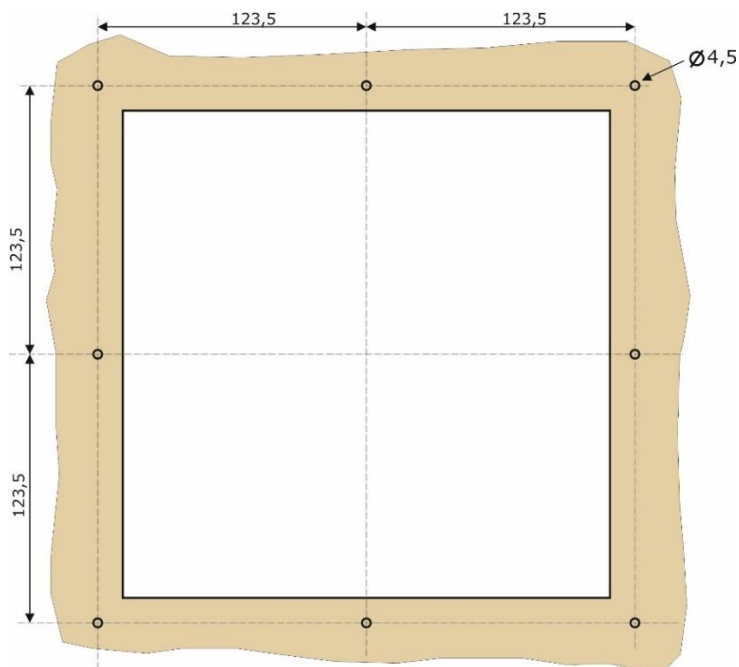
Cutout for Operator Panel with 16 keys; 128 x 128 mm²



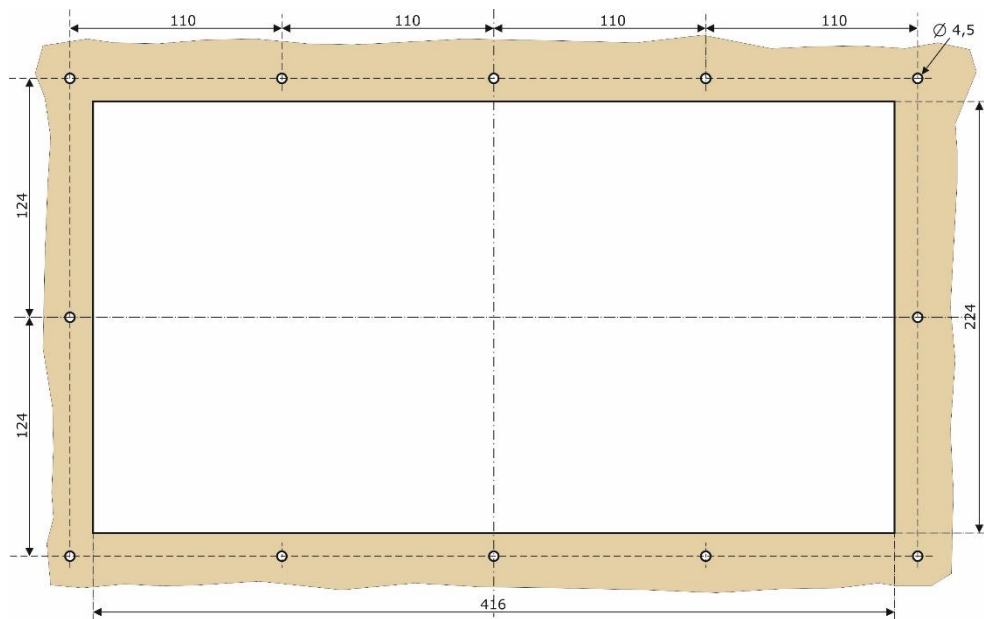
Cutout for Operator Panel with 32 keys; 224 x 128 mm²



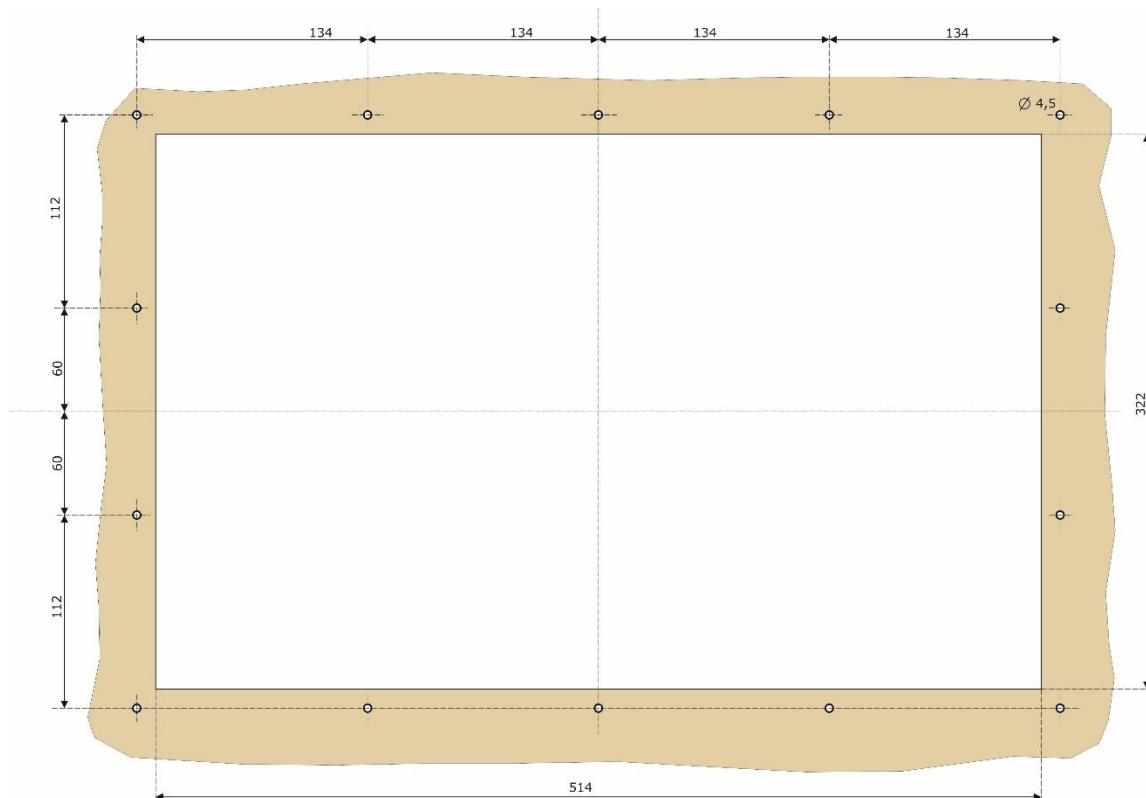
Cutout for Operator Panel with 60 keys; 320 x 152 mm²



Cutout for Operator Panel with 64 keys; 224 x 224 mm²



Cutout for Operator Panel with 128 keys; 416 x 224 mm²



Cutout for Operator Panel with 240 keys; 514 x 332 mm²

3. Interface Description

3.1 Profibus-Interface

External Connections

- | | |
|----------------------|--|
| ▪ Target device | Profibus-Master |
| ▪ J/F case connector | 9-pin SUB D-female plug |
| ▪ G case connector | Cable fixed on the rear side with attached transceiver box |

Properties

- | | |
|----------------------------------|------------------|
| ▪ Physical interface type | RS 485, floating |
| ▪ Transmission procedure | Profibus DP |
| ▪ GSD-file | ibp_9612.gsg |
| ▪ Keyboard identification number | 0x9612 |
| ▪ Default slave number | 126 |

usable GSD-Modules

- | | |
|----------|---|
| ▪ Module | PCF 1612 – V16 T1 Z20, PCF 1612 – V32 T1 Z30
PCF 1612 – V60 T1 Z64, PCF 1612 – V64 T1 Z40
PCF 1612 – V128 T1 Z15, PCF 1612 – V240 T1 Z70
PCF 1612 – V256 T1 Z121 |
|----------|---|

3.2 Profinet-Interface

External Connections

- | | |
|----------------------|---|
| ▪ Target device | Profinet-Master |
| ▪ J/F case connector | RJ45 socket, optionally 4-pin flange socket M12 |

Properties

- | | |
|----------------------------------|--|
| ▪ Physical interface type | Ethernet, Slave |
| ▪ Transmission procedure | 100BASE-TX or 10BASE-T, isolated 3 |
| ▪ GSDML-File | PCF 1612 – X16 Z20, PCF 1612 – X32 Z30
PCF 1612 – X60 Z64, PCF 1612 – X64 Z40
PCF 1612 – X128 Z15, PCF 1612 – X240 Z70
PCF 1612 – X256 Z101 |
| ▪ Keyboard identification number | 0x9612 |
| ▪ Default IP-address | 192.168.1.2 |

3.3 EtherCat-Interface

External Connections

- | | |
|----------------------|---|
| ▪ Target device | EtherCat-Master |
| ▪ J/F case connector | RJ45 socket, optionally 4-pin flange socket M12 |

Properties

- | | |
|----------------------------|--|
| ▪ Physical interface type | Ethernet, Slave |
| ▪ Transmission procedure | 100BASE-TX or 10BASE-T, isolated 3 |
| ▪ Default register address | 1000 |
| ▪ XML-File | PCF 1612 – X16 Z20, PCF 1612 – X32 Z30
PCF 1612 – X60 Z64, PCF 1612 – X64 Z40
PCF 1612 – X128 Z15, PCF 1612 – X240 Z70
PCF 1612 – X256 Z101 |

4. Range of Variations

4.1 Housing Design

Operator housing F

- Operator housing dispose of a removable inscription frame which facilitates enormously the change of the colour foil. Protection class from the front IP65 and IP54 with the connector M12 or D-Sub9. For mounting into Pulpits or switch cabinets.

Built-In housing J

- The change of the colour foil is from behind and has a protection class IP54 on the front side. This housing allows the mounting in wooden and steel pulpits.

Desktop housing G

- Desktop housing dispose of a removable inscription frame which facilitates enormously the change of the colour foil. The operating field is sunk a little bit with respect to the case surface. The protection class is IP54.

4.2 Interfaces

Pure Profibus Devices

- **T1** Single Profibus interface equipped with the standardized 9-pin SUB D connector P1

EtherCat-Devices

- **E1** Single EtherCat interface equipped with the standardized 4-pin flange socket M12
- **E2** Single EtherCat interface equipped with the standardized RJ45 connector

Profinet-Devices for Operator Panel

- **N1** Single Profinet interface equipped with the standardized 4-pin flange socket M12
- **N2** Single Profinet interface equipped with the standardized RJ45 connector

Profinet-Devices for Built-in

- **N1** Single Profinet interface equipped with the standardized RJ45 connector

4.3 Power Connection

- **L24** 3-meter long power cord with multicore cable ends
- **N230** 3-meter long power cord with European Plug
- **N110** 2-meter long power cord with American Plug
- **N22C** 2-meter long power cord with Chinese Plug

4.4 Z-number

- **Z15** 128 keys with horizontal Incrementation
- **Z17** 160 keys with horizontal Incrementation
- **Z20** 16 keys with horizontal Incrementation
- **Z30** 32 keys with horizontal Incrementation
- **Z40** 64 keys with horizontal Incrementation
- **Z64** 60 keys with horizontal Incrementation
- **Z70** 240 keys with horizontal Incrementation
- **Z181** 256 keys with horizontal Incrementation

4.5 Ordering Code

Example 1: Built-in keyboard with 60 keys, one Profinet-Interface with RJ45 socket, power connection 24 Voltage and 60 keys with horizontal counting.

➔ PCF 1612 J – V60 T1 L24 Z64

Example

PCF 1612	♦ Product family
PCF	♦ Product abbreviation: Process Control Foilscreen keyboard
1612	♦ Product number
J	♦ Case execution
–	♦ Separation mark between basic and special features
V60	♦ Number of keys
N1	♦ Interface description
L24	♦ Power connection
Z64	♦ Z-number

Example 2: Operator Panel with 128 keys, one Profibus-Interface, power connection with European plug and 128 keys with horizontal counting.

➔ PCF 1612 F – V128 T1 N230 Z15

PCF 1612	♦ Product family
PCF	♦ Product abbreviation: Process Control Foilscreen keyboard
1612	♦ Product number
F	♦ Case execution
–	♦ Separation mark between basic and special features
V128	♦ Number of keys
T1	♦ Interface description
N230	♦ Power connection
Z15	♦ Z-number

5. Data Exchange

5.1 Commands from keyboard to PLC

Commands from PLC to keyboard till 256 keys								
Byte	Bit							
0	Sign of life							
1-7	Reserved							
8	8	7	6	5	4	3	2	1
9	16	15	14	13	12	11	10	9
10	24	23	22	21	20	19	18	17
11	32	31	30	29	28	27	26	25
12	40	39	38	37	36	35	34	33
13	48	47	46	45	44	43	42	41
14	56	55	54	53	52	51	50	49
15	64	63	62	61	60	59	58	57
16	72	71	70	69	68	67	66	65
17	80	79	78	77	76	75	74	73
18	88	87	86	85	84	83	82	81
19	96	95	94	93	92	91	90	89
20	104	103	102	101	100	99	98	97
21	112	111	110	109	108	107	106	105
22	120	119	118	117	116	115	114	113
23	128	127	126	125	124	123	122	121
24	136	135	134	133	132	131	130	129
25	144	143	142	141	140	139	138	137
26	152	151	150	149	148	147	146	145
27	160	159	158	157	156	155	154	153
28	168	167	166	165	164	163	162	161
29	176	175	174	173	172	171	170	169
30	184	183	182	181	180	179	178	177
31	192	191	190	189	188	187	186	185
32	200	199	198	197	196	195	194	193
33	208	207	206	205	204	203	202	201
34	216	215	214	213	212	211	210	209
35	224	223	222	221	220	219	218	217
36	232	231	230	229	228	227	226	225
37	240	239	238	237	236	235	234	233
38	248	247	246	245	244	243	242	241
39	256	255	254	253	252	251	250	249
Hex Value	0x80	0x40	0x20	0x10	0x08	0x04	0x02	0x01

► Sign of life

Increments by one all 100ms

► Keyboard Commands

Each bit reflects a key and can be evaluated directly. The key 1 has the hex value of 0x01 and is in Byte 1 in the first bit. The lifetime of the key press is 100ms.

All keys are queried in a very fast cycle and thus all keys can be pressed and evaluated simultaneously.

5.2 Commands from PLC to keyboard

Commands from PLC to keyboard till 256 keys	
Byte	
0	Reserved
1	Alert Commands
2	Access List for frequency and volume
3	Settings of the Volume
4	Setting for frequency 1
5	Setting for frequency 2
6	Setting for frequency 3
7	Switching between Buzzer and speaker
8	Controlling LED1
9	Controlling LED2
10	Controlling LED3
11	Controlling LED4
...	...
23	Controlling LED16
...	...
40	Controlling LED32
...	...
67	Controlling LED60
...	...
71	Controlling LED64
...	...
135	Controlling LED128
...	...
167	Controlling LED160
...	...
247	Controlling LED240 Exception of Profibus-Keyboards see on chapter 6
...	...
260	Controlling LED253
261	Controlling LED254
262	Controlling LED255
263	Controlling LED256

► **Byte 0: Reserved**

Byte 0 is reserved for internal applications

► **Byte 1: Alert messages**

Lamp test and alert messages can be set by byte 1

0x91	Short lamp test (without change of the existing messages)
0xA0	Alert off
0xA1	Alert 1, unlimited
0xA2	Alert 2, unlimited
0xA3	Alert 3, unlimited
0xA4	Sound of acknowledge
0xA5	Alert 1, for 5 seconds
0xA6	Alert 2, for 5 seconds
0xA7	Alert 3, for 5 seconds
0xA8	Siren

If an alarm has been set, it must be switched off again with 0xA0.

► **Byte 2: Access list for frequency and volume**

With this byte, the volume and the different frequencies are changeable. Only when the function has been switched on can it be used

0x01	Release for volume
0x02	frequency 1 on; default: 1,5 kHz
0x04	frequency 2 on; default: 2,0 kHz
0x08	frequency 3 on; default: 3,0 kHz
0x10	switching between speaker and buzzer

► **Byte 3: Volume**

The volume can be set in a scale of 1... 255.

The value 0 is the default value and is set to the value 15.

► **Byte 4: frequency 1**

► **Byte 5: frequency 2**

► **Byte 6: frequency 3**

These bytes can be used to generate 3 different frequencies. The calculation of the different frequencies is derived from the formula:

$$\text{frequency} = [1...255] * 10 + 500 \text{ Hz}$$

► **Byte 7: Speaker/Buzzer**

The 7th byte allows you to switch from buzzer to speaker, only one is active at a time.

Allowed Range: 0...1

Buzzer active: 0

Speaker active: 1

► **Byte 8...263: Controlling LEDs**

Byte 8 to 263 allows the controlling of the brightness and colour. The following truth table contains all necessary information.

Byte								Colour
7	6	5	4	3	2	1	0	Bit 0-7
0	0	0	0	0	0	0	0	off
0	0	0	0	0	0	0	1	red
0	0	0	0	0	0	1	0	green
0	0	0	0	0	0	1	1	yellow
0	0	0	0	0	1	0	0	blue
0	0	0	0	0	1	0	1	magenta
0	0	0	0	0	1	1	0	cyan
0	0	0	0	0	1	1	1	white
0	0	0	0	1	0	0	1	red 80%
0	0	0	0	1	0	1	0	green 80%
0	0	0	0	1	0	1	1	yellow 80%
0	0	0	0	1	1	0	0	blue 80%
0	0	0	0	1	1	0	1	magenta 80%
0	0	0	0	1	1	1	0	cyan 80%
0	0	0	0	1	1	1	1	white 80%

Example: The third LED should light up white with 80% brightness.

- Write the binary value B'0000 1111 or H'0F in byte 10

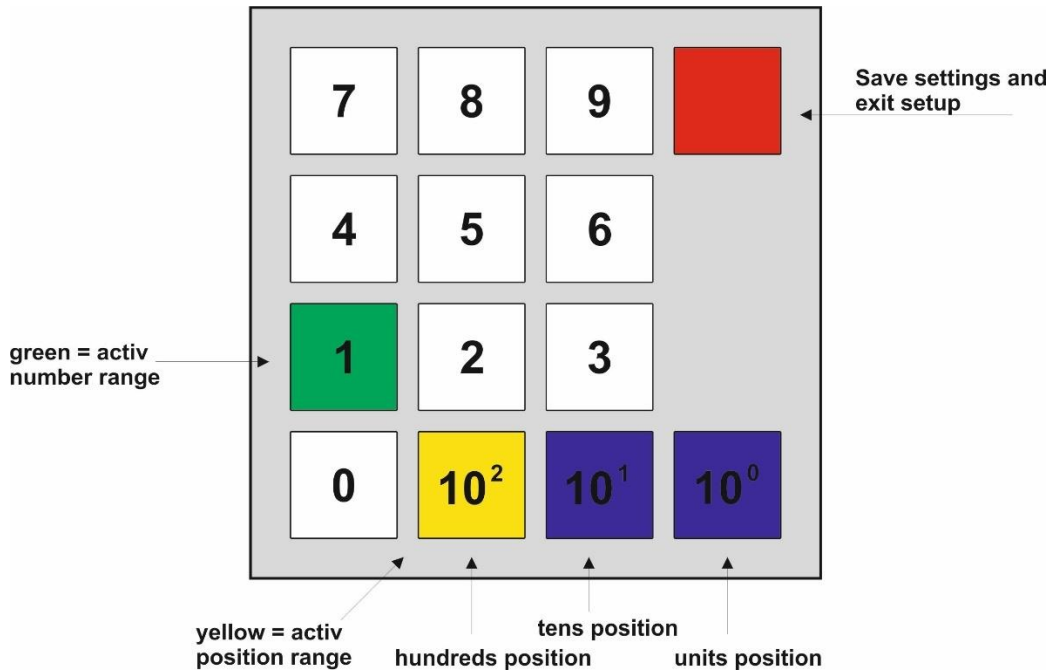
5.3 Profibus-Slave-Address

The slave address can be addressed via the bus or assigned manually.

If the address has been assigned, it will remain even after switching the device on and off. The possible range of slave numbers is between 2 and 125.

To reset the Slave-address, the first 4 buttons must to be pressed for 5 seconds.

Manually assignment of the Slave-address



The manual assignment of the slave address takes place over the hundreds, tens and units and the active position is illuminated in yellow. The single number is illuminated green in every range. If the address has been selected, press the red button for leave the settings.

Saving the address is only possible if it is not outside the permitted range.

The value 126 is used for automatic assignment.

Example: Select the Slave-address 115.

- Hundreds position is yellow and number 1 is illuminated green.
- Tens position is yellow and number 1 is illuminated green.
- Units position is yellow and number 5 is illuminated green.
- Save with the red bottom.

5.4. GSD Files Shipped with the Keyboard

The GSD files delivered with every keyboard are pure ASCII text files.

All GSD files contain numerous comments concerning the configuration and the parameter values.

6. Exception of the Profibus-Keyboard with 240 Keys.

The colour Information has packed into one Byte because the Profibus-telegram is limited to 244 Bytes. The key query remains unchanged.

6.1 Commands from the PLC to the Keyboard

Commands from PLC to keyboard with 240 keys	
Byte	
0	Reserved
1	Alert Commands
2	Access List for frequency and volume
3	Settings of the Volume
4	Setting for frequency 1
5	Setting for frequency 2
6	Setting for frequency 3
7	Switching between Buzzer and speaker
8	Controlling LED1 and LED2
9	Controlling LED3 and LED4
10	Controlling LED5 and LED6
11	Controlling LED7 and LED8
...	...
...	...
124	Controlling LED233 and LED234
125	Controlling LED235 and LED236
126	Controlling LED237 and LED238
127	Controlling LED239 and LED240

► Byte 8...127: Controlling LEDs

Byte 8 to 127 allows the controlling of the brightness and colour. The following truth table contains all necessary information.

Example: Third LED green and fourth LED red

- Write in byte 9 a hex value of H'21.

Nibble 2				Nibble 1				colour
Bit 4-7				Bit 0-3				
7	6	5	4	3	2	1	0	
0	0	0	0	0	0	0	0	off
0	0	0	1	0	0	0	1	red
0	0	1	0	0	0	1	0	green
0	0	1	1	0	0	1	1	yellow
0	1	0	0	0	1	0	0	blue
0	1	0	1	0	1	0	1	magenta
0	1	1	0	0	1	1	0	cyan
0	1	1	1	0	1	1	1	white
1	0	0	1	1	0	0	1	red 80%
1	0	1	0	1	0	1	0	green 80%
1	0	1	1	1	0	1	1	yellow 80%
1	1	0	0	1	1	0	0	blue 80%
1	1	0	1	1	1	0	1	magenta 80%
1	1	1	0	1	1	1	0	cyan 80%
1	1	1	1	1	1	1	1	whit 80%