

**Details of the Middle-Sized Built-in Devices with 128 Keys**

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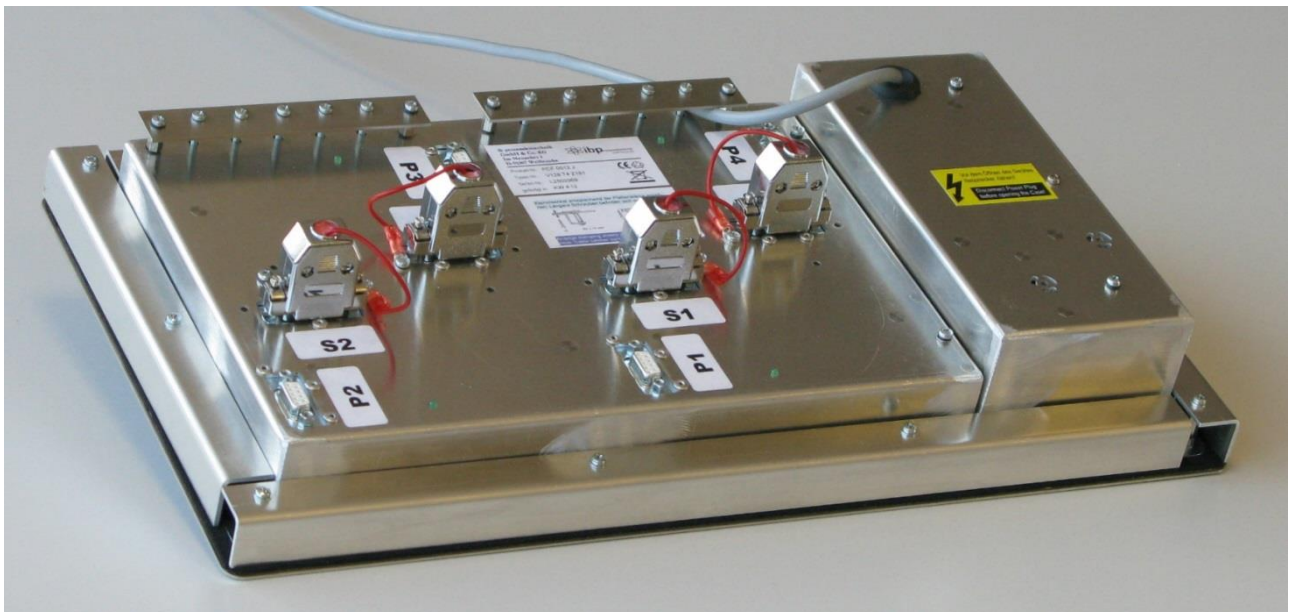
♦ Subject to change ♦

## 1. Mounting of the Middle-Sized Built-in Device

### 1.1 Device Views and Details

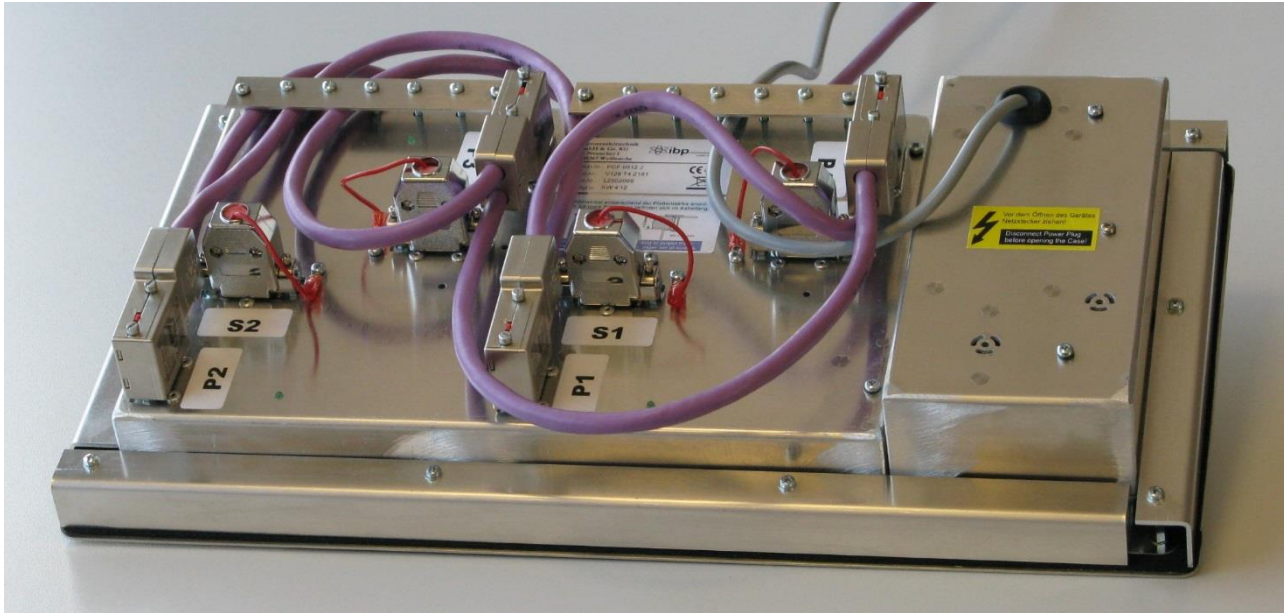


Pict. 2-1: Device front with customer-specific colour foil



Pict. 2-2: Device with four Profibus interfaces, seen from below

Keyboards with several Profibus interfaces use a dedicated control module with every single Profibus line. The key panel and both hooters are connected to the first module whereby assigning a leading function to it. Internally, the modules communicate via an RS 485 interface involving the R.Th.InterKom procedure. Hence, the leader notifies each key stroke on the key panel via this serial bus and, reciprocally, gets all illumination information by the followers which repeat their Profibus master's instructions. At the PLC programmer's point of view, the individual Profibus modules behave like entirely independent keyboards. There is only one aspect the programmer must consider. No module's LED range must intervene with another module's LED range to avoid situations in which one module's LED is overwritten by another module's instruction.



Pict. 3-3: Same device with four Profibus interfaces, all of them being connected

## 1.2 Characteristic Values

|                                      |                                                                                                                                           |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| ▪ Dust and Humidity Protection       |                                                                                                                                           |
| In front of the key panel            | IP 54                                                                                                                                     |
| ▪ Key Panel                          |                                                                                                                                           |
| Suspension frame outline             | 436 x 244 mm <sup>2</sup>                                                                                                                 |
| Suspension frame interior            | 390 x 198 mm <sup>2</sup>                                                                                                                 |
| ▪ Pulpit Opening                     |                                                                                                                                           |
| Necessary spacing                    | 423 x 231 mm <sup>2</sup>                                                                                                                 |
| Execution                            | Due to the splitting effect caused by sharp angles, we recommend to smooth all corners with an 8 mm radius for wooden or plastic pulpits. |
| ▪ Intrusion Depth                    |                                                                                                                                           |
| Connectors fixed to the device       | 80 mm measured from the pulpit surface downwards                                                                                          |
| ▪ Weight                             |                                                                                                                                           |
| Device incl. of mounting accessories | 3,6 kg                                                                                                                                    |

## 1.3 Mounting Accessories Supplied with each Device

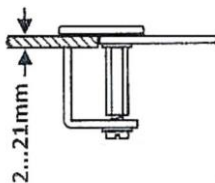


Fig. 3-4: Mounting scheme for metal pulpits

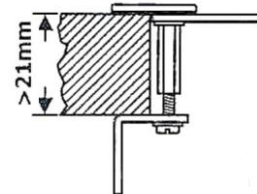


Fig. 3-5: Mounting scheme for wooden or plastic pulpits

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 14 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 millimeters, 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. Means of Input and Output

### 2.1 Key Panel

|                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Switching Matrix</li> </ul>                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Designation                                                                                       | Middle size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Number of keys                                                                                    | 128                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Arrangement                                                                                       | 8 lines x 16 columns                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>Switching Cells</li> </ul>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Key chamber (own product)                                                                         | ibpro20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Switching contacts                                                                                | 2 x 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Length of actuation path                                                                          | 0,25 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Key chamber opening                                                                               | 20 x 20 mm <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Distance from center to center                                                                    | 24 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>Illuminating Cells</li> </ul>                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Illuminable area                                                                                  | 20 x 20 mm <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Basic colour 1                                                                                    | green: 571 nm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Basic colour 2                                                                                    | red : 631 nm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Composite colour                                                                                  | yellow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>Foil Layers</li> </ul>                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Key cover                                                                                         | 1 <sup>st</sup> transparent foil sticking to the supporting grid which intercepts the keys                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Middle layer                                                                                      | Colour foil with project-specific inscriptions and grafical symbols<br>(a coloured foil will only be mounted, if explicitly ordered by the customer)                                                                                                                                                                                                                                                                                                                                                                                   |
| Foil freezing and abrasion resistance                                                             | 2 <sup>nd</sup> 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 sand-wich are covered and fixed by the surrounding suspension frame.                                                                                                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>Typical Design of Project-Specific Colour Foils</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Key inscriptions                                                                                  | Black on transparent background                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Disposable area                                                                                   | 19 x 19 mm <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Framing                                                                                           | Black with thickness of 1 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Some remarks about colouring the keys' interior                                                   | If a key's inscription area is coloured in yellow, red or green, those colours act like a colour filter would do. They make a <i>single</i> colour appear brilliantly. Wherever this enhancing effect is wanted for signaling, we recommend to colour the area within the key's frame. As a general rule, you should be aware that colours reduce the contrast with the inscription as long as the key area is not illuminated, thereby reducing the readability of text, if the illumination on the place of operation is rather dim. |
| Functional blocks                                                                                 | Different functional blocks are marked by different colours, whereby these functional colours are aligned with the interstices between the keys' frames. We recommend to use bright colours. Dark colours give the foil a sombre appearance.                                                                                                                                                                                                                                                                                           |
| Graphics                                                                                          | Firm insignia, schematic and symbolic representations or diverging foil design will be based on the customer's requests or patterns.                                                                                                                                                                                                                                                                                                                                                                                                   |

## 2.2 Hooters

|                           |                                                                                                                           |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------|
| ▪ Built-in Hooter 1       |                                                                                                                           |
| Designation               | Beeper                                                                                                                    |
| Place of installation     | Sound opening on the device bottom                                                                                        |
| Frequency range           | 50 Hz ... 15 kHz                                                                                                          |
| Internal device usage     | Acoustical acknowledgement or refusal of key entries                                                                      |
| Loudness adaptation       | Adaptation of the parameters for the positive or negative acknowledgement sound                                           |
|                           | a) via the manual parameter selection, b) by changing the gsd file entries                                                |
| External hooter control   | Alert sounds depending on the capabilities of the transmission procedure                                                  |
| Loudness adaptation       | Alert sounds are always generated at the maximum loudness level, reduced loudness level for acknowledgement sounds        |
|                           | a) elapse of pre-fixed time interval, b) via the reset code of the transmission procedure, c) by pushing an arbitrary key |
| Reset of the alert sounds |                                                                                                                           |
| ▪ Built-in Hooter 2       |                                                                                                                           |
| Designation               | Alert hooter                                                                                                              |
| Place of installation     | Sound opening on the device bottom                                                                                        |
| Operating frequency       | 3,1±0,5 kHz                                                                                                               |
| Internal device usage     | Short beep after power-on                                                                                                 |
| Loudness adaptation       | Not possible                                                                                                              |
| External hooter control   | Alert sounds depending on the capabilities of the transmission procedure                                                  |
| Loudness adaptation       | Loudness always at maximum level                                                                                          |
| Reset of the alert sounds | a) elapse of pre-fixed time interval, b) via the reset code of the transmission procedure                                 |

### 3. Range of Variations

#### 3.1 Ordering Information

##### PCF 0512 J – V128 T1 N230 Zxxx

Example

|          |                                                              |
|----------|--------------------------------------------------------------|
| PCF 0512 | ◆ Product family                                             |
| PCF      | ◆ Product abbreviation : Process Control Foilscreen keyboard |
| 0512     | ◆ Product number                                             |
| J        | ◆ Case execution                                             |
| –        | ◆ Separation mark between basic and special features         |
| V128     | ◆ Number of keys                                             |
| T1       | ◆ Interface description                                      |
| N230     | ◆ Power connection                                           |
| Zxxx     | ◆ Z number                                                   |

Up to the number of keys, the ordering designation of all built-in keyboards with 128 keys is invariable. The disposable interface types are described in section 3.2, whereas section 3.3 summarizes the different types of power connections.

The Z number designates the project-specific particularities. Each variation of the keyboard functions is assigned to a unique Z number which will appear in the order confirmation and on the dispatch note. By using it for re-ordering, the customer may be assured to get the same device, once again. The Z number assigned to the device is transferred to the keys' functioning resulting in a full code number like PCF 0512 – X128 Zxxx.

#### 3.2 Interfaces

- Pure Profibus Devices
  - T1** Single Profibus interface equipped with the standardized 9-pin SUB D connector P1, usual Z number of this device type: **Z15**.
  - T2** 2 entirely separated Profibus interfaces with 2 independent modules in a single device
  - T3** 3 entirely separated Profibus interfaces with 3 independent modules in a single device
  - T4** 4 entirely separated Profibus interfaces with 4 independent modules in a single device
- Devices with 128 keys and more than one Profibus interface are registered with Z No. **Z181**.
- Pure PS/2 Devices
  - B1** Single PS/2 interface. The appertaining PS/2 data line **C111** is directly fixed to the case and has a length of about 2 m.  
As a consequence of the protocoll, the LED's of the PS/2 devices are not addressable from outside. Only, when modifying keys such as ALT, Ctrl or Shift are used, the combination between a modifier and a character key will be marked, optically.
- Pure USB Devices
  - H1** Single USB interface. The current way of implementation uses a PS/2 interface with a **C111** cable and an adjacent USB converter.
- Pure Serial Devices
  - S1** Single serial interface connected to the 12-pin miniature round connector used by the old product families PCF 8812 / 9612.  
The physical interface implementation depends on the transmission protocoll and on the target device. The controllers can be equipped with V.24 = RS 234 C and X.27 = RS 422 interfaces. Only the „Restricted R.Th.Transmission“ provides control of the coloured LED's. Older transmission procedures are restricted to the one-coloured red LED control of the product families PCF 8812 / 9612 / 0412.
  - S2** 2 serial interfaces
- Mixed Interface Usages
  - P11** 1 Profibus & 1 PS/2 interface - old ibp designation : **P2**
  - I11** 1 Profibus & 1 USB interface
  - G12** 1 Profibus & 2 serial interface - old ibp designation : **G3**
  - G32** 3 Profibus & 2 serial interfaces

- Historical Devices

**Y1** TTY interface – only as a replacement for old PLT / PLTM devices

### 3.3 Mains Adaptation

- Connected Load

|                                                          |                |
|----------------------------------------------------------|----------------|
| Large input voltage range                                | 90 ... 264 V~  |
| Inrush current, maximally                                | 50 A at 264 V~ |
| Frequency range                                          | 47 ... 63 Hz   |
| Nominal power                                            | 60 W           |
| Awaited maximal power                                    | 30 W           |
| (with full yellow illumination)                          |                |
| Stand-by power, maximally                                | 2,5 W          |
| (with only the operating control lamp being illuminated) |                |

- Cable Variants

**N230** Power cord with European style plug, about 3 m long

As this is the standard execution, the designation N230 is normally not used.



**N110** Power cord with US American style plug, about 2 m long



**N22C** Power cord with Chinese style plug, about 2 m long



**L230** 3 m long power cord with multicore cable ends fixed to terminal box

