# Details of the Lilliputian-Sized Built-in Devices with 15 Keys

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1. Mounting of the Lilliputian-Sized Built-in Device

1.1 Device Views and Details

Pict. 2-1: Device front with illuminated keys

Pict. 2-2: Bottom view of a Profibus device, longitudinal view
0512 series devices with 15 keys combine control unit and power supply in a single bottom tub.

Picture 3-3 shows the device lying on its suspension frame which prevents the keyboard in conjunction with the upper and lower clamping sheet from slipping within the pulpit.

In picture 2-2, the Profibus device can be seen with all connectors in place. The service plug S1 should always be connected during operation. The encoding within this plug is read at power-on, disabling the parameter selection request, when it is detected.

Picture 2-1 provides a good glance on the mechanical details. First to mention, there is the surrounding suspension frame with the supporting grid below it and within the latter’s openings the key tops.

1.2 Characteristic Values

- Dust and Humidity Protection
  In front of the key panel IP 54
- Key Panel
- Suspension frame outline 172 x 124 mm²
- Suspension frame interior 126 x 78 mm²
- Pulpit Opening
- Necessary spacing 160 x 112 mm²
- Execution
  - Intrusion Depth
  - Connectors fixed to the device 95 mm measured from the pulpit surface downwards
- Weight
  - Device incl. of mounting accessories 1.1 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. Screws with a length of M3 x 25 mm can be used.
2. Means of Input and Output

2.1 Key Panel

- Switching Matrix
  - Designation: Lilliputian size
  - Number of keys: 15
  - Arrangement: 3 lines x 5 columns

- Switching Cells
  - Key chamber (own product): ibpro20
  - Switching contacts: 2 x 2
  - Length of actuation path: 0,25 mm
  - Key chamber opening: 20 x 20 mm²
  - Distance from center to center: 24 mm

- Illuminating Cells
  - Illuminable area: 20 x 20 mm²
  - Basic colour 1: green: 571 nm
  - Basic colour 2: red: 631 nm
  - Composite colour: yellow

- Foil Layers
  - Key cover: 1st transparent foil sticking to the supporting grid which intercepts the keys
  - Middle layer: Colour foil with project-specific inscriptions and graphical symbols
    (a coloured foil will only be mounted, if explicitly ordered by the customer)
  - Fixing: 2nd transparent foil laid upon the colour foil to prevent it from mechanical abrasion and dazzling effects

- Typical Design of Project-Specific Colour Foils
  - Key inscriptions: Black on transparent background
  - Disposable area: 19 x 19 mm²
  - 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 single 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.
  - Firm insignia, schematic and symbolic representations or diverging foil design will be based on the customer’s requests or patterns.

2.2 Hooter

- Built-in Hooter
  - Designation: Beeper
  - Place of installation: Sound opening on the device bottom
  - Frequency range: 50 Hz ... 15 kHz
  - Acoustical acknowledgement or refusal of key entries
    - Internal device usage: Adaptation of the parameters for the positive or negative acknowledgement sound
    - Loudness adaptation: a) via the manual parameter selection, b) by changing the gsd file entries
  - External hooter control
    - Adaptive loudness adaptation: Alert sounds depending on the capabilities of the transmission procedure
    - Alert sounds are always generated at the maximum loudness level, reduced loudness level for acknowledgement sounds
    - Reset of the alert sounds: a) elapse of pre-fixed time interval, b) via the reset code of the transmission procedure, c) by pushing an arbitrary key
3. Range of Variations

3.1 Ordering Information

PCF 0512 J – V15 T1 N230 Zxxx Example

- PCF 0512 • Product family
- 0512 • Product abbreviation: Process Control Foilscreen keyboard
- J • Case execution
- V15 • Separation mark between basic and special features
- T1 • Number of keys
- N230 • Interface description
- Zxxx • Power connection

Up to the number of keys, the ordering designation of all built-in keyboards with 15 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 – X15 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: Z150.

- 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. 0512 devices with 15 keys replace the former PCF 0312 J – U15 B1 Zxxx product line. As a consequence of the protocol, 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. There is no acoustical feedback.

- 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.

3.3 Mains Adaptation

- Connected Loads with Mains Adaptations N230, N110 or L230
  Power supply Power supply for printed circuit boards
  Usage restricted to Interface type T1
  Large input voltage range 85 ... 264 V~
  Inrush current, typically 15 A at 100 V~, 30 A at 200 V~
  Frequency range 47 ... 440 Hz
  Nominal power 10 W
  Awaited maximal power 7 W
  (with full yellow illumination)
  Stand-by power, maximally 1.5 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

• Connected Load with Mains Adaptation **X230**
  
  Power supply  Integrated in the plug
  Usage restricted to  Interface types **B1** or **H1**
  European input voltage range  180 ... 264 V~
  Frequency range  47 ... 440 Hz
  Nominal power  15 W

• Cable Variant

**X230**  About 3 m long power cord with European style plug

* Made in Germany *