

## USB-C in der Industrie – Einfach. Stark. Zukunftssicher.

30.09.2025

*Product Management – Stefan Zieboll*

INTEGRATED

POWER

EGYPT

UNITED KINGDOM

CZECH REPUBLIC

SWITZERLAND

UNITED STATES

# Industrial I/O

The industry has been suffering for decades, missing a reliable, fast and rugged interface

- Serial interface like RS-232 or RS-485 offer a rugged physical connection
- USB a field proven and reliable embedded interface
- USB not reliable where shock & vibrations occur.
- Power delivery quite poor.

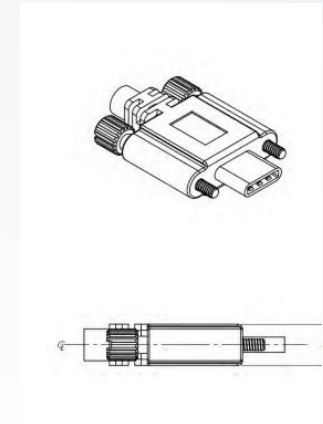
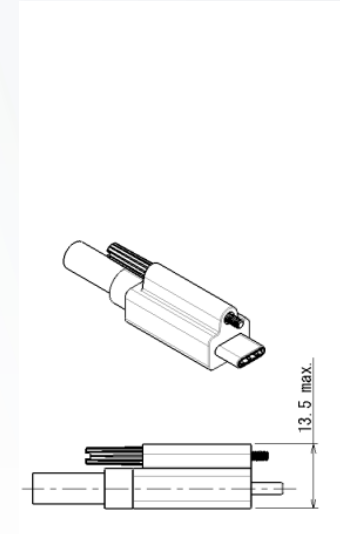


# USB-C – Redefining Industrial IoT

A single cable, infinite possibilities

- USB-C has become the universal I/O in consumer market
- The USB-C standard
  - Defines the mechanical design, not the data rate
  - Per design USB-C can't be connected wrong
  - Defines lockable USB plugs with single or dual screw fixture
  - 10.000+ plug cycles
- USB-C redefines industrial IoT
  - More efficient, more safe and more flexible infrastructure
  - Ultra rugged connection

Not every USB-C cable offers all features required!



# USB-C – Redefining Industrial IoT

A single cable, infinite possibilities

Always check the data sheet to ensure USB-C offers all features required!

## ■ The USB-C standard

- Allows to transmit data, power and video signal through a single cable at the same time
- Power delivery up to 100W in SPR-Mode, Embedded boards normally provide 60W
- Alt-mode allows to provide other signals than USB. Most common video signals are provided with DisplayPort



## EINKABELLÖSUNG PER USB-C | SINGLE-CABLE SOLUTION VIA USB-C





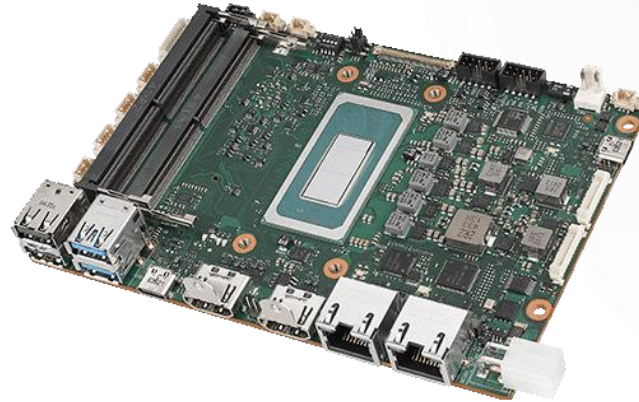
# USB-C in Embedded

- USB-C Monitor
- USB-C SBC
- USB-C Box-PC
- USB-C AD Boards
- Combinations of above
  - USB-C HMI

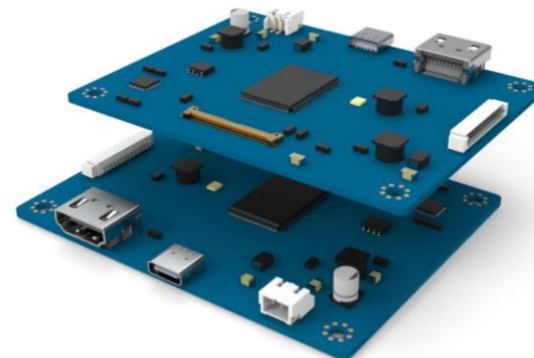
**ADVANTECH**  
*Enabling an Intelligent Planet*



**iBASE**



**FORTEC**  
INTEGRATED



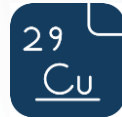
**FORTEC**  
INTEGRATED

# Green design by reducing cables

Resources and CO2 can be saved through new solutions

| Cable type                                | Standard solution | 1-cable solution |
|-------------------------------------------|-------------------|------------------|
| DisplayPort                               | 240 gr.           |                  |
| USB-A to USB-B                            | 100 gr.           |                  |
| USB-A to USB-B                            | 100 gr.           |                  |
| 24 V Power supply                         | 70 gr.            |                  |
| USB-C                                     |                   | 200 gr.          |
| Total copper content                      | 510 gr.           | 200 gr.          |
| Savings in copper cables per machine      |                   | 310 gr.          |
| Savings on 1,000 monitors p.a. in 5 years |                   | 1,5 To.          |

Source: ChatGPT

|                                                                                      |                                          |                       |
|--------------------------------------------------------------------------------------|------------------------------------------|-----------------------|
|   | Reduction of Cu over 5 years             | 1,5 t                 |
|   | Reduction CO <sub>2</sub>                | 5,6 t CO <sub>2</sub> |
|   | CO <sub>2</sub> savings recycled copper* | 4,1 t CO <sub>2</sub> |
|  | Carbon Sequestration Equivalent          | 130 trees             |

Amount of copper recycled copper for 1-cable solution: 1.0 tons.  
(200 gr. copper / 1,000 monitors p.a. / 5 years)

- Average calculation for a cable length of 5 meters – exact information must be taken from the manufacturer's data sheets
- Up to 85% less energy is required in the production of recycled copper, so that additional CO2 savings can be made when switching to cables with recycled copper.



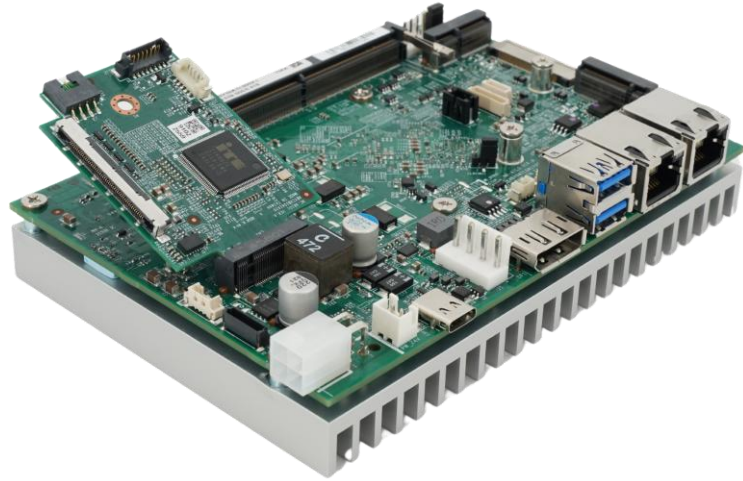
# Application Scenarios

BPC-/SBCPRO-X51 simplifies industrial solutions



# Introducing SBCPRO-X51

Modular 3.5" SBC featuring Intel® AmstonLake Atom® x7211RE



- Modular design – M.2 Expansion modules expand use case way beyond the common 3,5" SBC
- Designed to support EU Eco-Design regulation – Offering low stand-by power consumption
- Protect investment – Designed to run 24/7
- Windows 11 IoT LTSC support

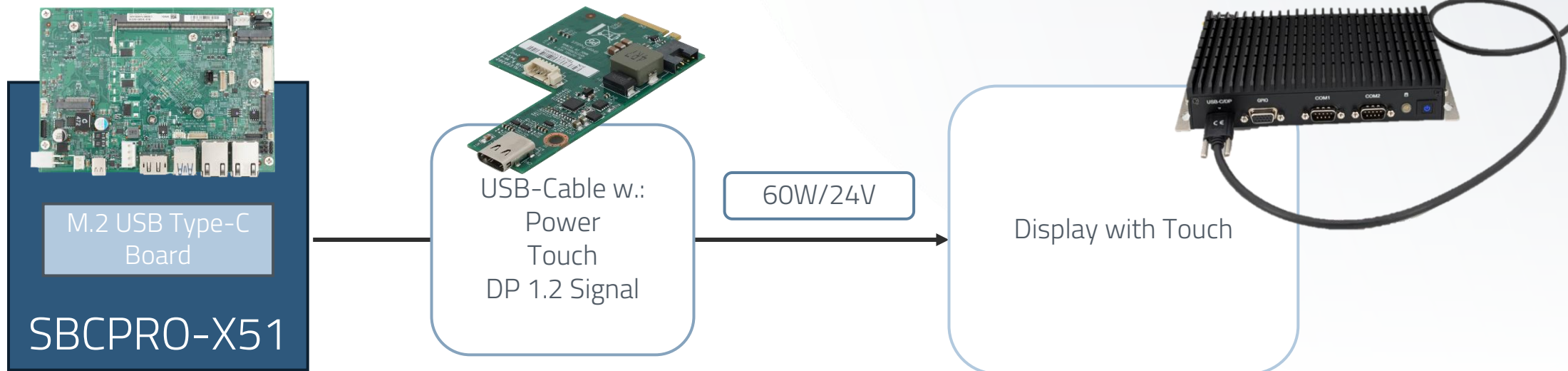
- Intel® **AmstonLake Atom®** x7211RE, 2C up to 3.20GHz , TDP 6W,
- 1 x SO-DMM, **DDR5 up to 16GB**
- 1x eDP, 1 x DP, 1 x V-BY-ONE or USB-C with PD by M.2 extension card
- 1x Backlight Power 5V/12V with max. 1.5A
- 1 x M.2 M key 2242 for Storage
- 1 x M.2 2230 for Wi-Fi;
- 1 x **M.2 Slot for SBCPRO-X51 expansion modules**
- 2 x LAN 10/100/1000/2500 Mbit/s
- 2 x RS-232/422/485 (internal) switchable in BIOS
- 1x Type-C USB 3.2 Gen 1x1 (external)
- 2 x USB 3.2 (external); 2 x USB 2.0 (internal)
- 1x I<sup>2</sup>C, GPIO: 4-IN + 4-OUT w.5V/1A, 1x FAN
- TPM 2.0; Mic in/Line out 6W AMP
- Watchdog
- Operating Temp: -20 ~ 80 °C
- 24VDC output Power PXC 2-pin connector
- **3.5" Size** 146 (W) x102 (D)



# Adaptor Card USB TYPE-C

## ACCS-EMB-M2USBC-00

- USB-TYPE C connector delivering 60W to drive panel and touch
  - Reduce cable connections
    - Less cost
    - Less effort
    - Less issues
  - Alternate Mode providing DP via USB-Type-C
  - Power delivery 24V from board to display



# Introducing BPCPRO-X51

Edge IoT USB-C Box-PC featuring Intel® AmstonLake Atom® x7211RE



- Energy efficient design - Designed to support Eco-Design – Offering low stand-by power consumption
- No „cable spaghetti“ – 1x USB-C to drive and power the display, USB data to drive the touch
- Protect investment – Designed to run 24/7
- Windows 11 IoT LTSC support

- Intel® **Amston Lake-N Atom®** x7211E, 2C up to 3.20GHz , TDP 6W
- 1 x SO-DIMM, DDR5 up to 16GB
- 1x DP, 1x USB-C alt mode with **PD for external Displays** (USB 2.0)
- 1 x M.2 M key 2242 for Storage, 1 x M.2 2230 for Wi-Fi
- 2 x LAN 10/100/1000/**2500** Mbit/s, 2x SMA (optional)
- 2 x RS-232/422/485 (optional) switchable in BIOS
- 1x Type-C USB 3.2 Gen 1x1, 2 x USB 3.2
- 1x GPIO (optional): **4-IN + 4-OUT** w.5V/1A
- TPM 2.0, Watchdog
- 24V DC-in
- Industrial Design for 24/7 use & Operating Temp: -20 ~ 70 °C
- 203.5(W)x118(D)x39.9(H) mm
- **CE, FCC Certified**

# BPCPRP-X51 securing USB-C

USB-C cable with 1 or 2 screw locking mechanism can be mounted





# As Simple as it can be

Connecting a touch display by USB-C



# Contact

## FORTEC GROUP

FORTEC Elektronik AG | Augsburgs Straße 2b | 82110 Germering  
+49 89 894450-0  
[info@fortecag.de](mailto:info@fortecag.de) | [www.fortecag.de](http://www.fortecag.de)

## FORTEC INTEGRATED

FORTEC Integrated GmbH | Augsburgs Straße 2b | 82110 Germering  
+49 89 894363-0  
[info@fortec-integrated.de](mailto:info@fortec-integrated.de) | [www.fortec-integrated.de](http://www.fortec-integrated.de)

## FORTEC EGYPT

FORTEC Electronic Design and Solution Egypt SMLC | Linx Business Park Unit B318 | Smart Village | Giza Governorate  
[info@fortec-integrated.de](mailto:info@fortec-integrated.de) | [www.fortec-integrated.de](http://www.fortec-integrated.de)

## FORTEC CZECH REPUBLIC

FORTEC Czech Republic s.r.o. | Přátelství 275 | 330 02 Dýšina  
+420 377 845878  
[fortec@fortec.cz](mailto:fortec@fortec.cz) | [www.fortec.cz](http://www.fortec.cz)

## FORTEC SWITZERLAND

FORTEC Switzerland AG | Bahnhofstraße 3 | 5436 Würenlos  
+41 44 7446111  
[info@fortec.ch](mailto:info@fortec.ch) | [www.fortec.ch](http://www.fortec.ch)

## FORTEC POWER

FORTEC Power GmbH | Lise-Meitner-Straße 3 | 64560 Riedstadt  
+49 6158 8285-0  
[weborder@fortec-power.de](mailto:weborder@fortec-power.de) | [www.fortec-power.de](http://www.fortec-power.de)

## FORTEC POWER

Autronic Steuer- und Regeltechnik GmbH | Siemensstraße 17 | 74343 Sachsenheim  
+49 7147 24-0  
[vertrieb@autronic.de](mailto:vertrieb@autronic.de) | [www.autronic.de](http://www.autronic.de)

## FORTEC UNITED STATES

FORTEC United States, Corp. | 87 Raynor Avenue Unit 1 | Ronkonkoma NY | 11779  
+1 631 5804360  
[info@fortec.us](mailto:info@fortec.us) | [www.fortec.us](http://www.fortec.us)

## FORTEC UNITED KINGDOM

FORTEC Technology UK Ltd. | Osprey House | 1 Osprey Court | Hinchingsbrooke Business Park | Huntingdon | Cambridgeshire | PE29 6FN  
+44 1480 411600  
[info@fortec.uk](mailto:info@fortec.uk) | [www.fortec.uk](http://www.fortec.uk)