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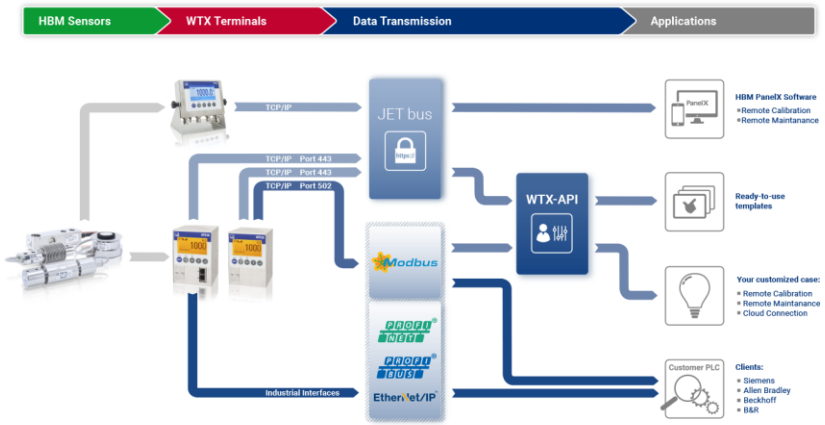
WEBINAR: WTX API

HOW TO CREATE YOUR OWN WEIGHING-APPLICATION USING THE OPEN SOURCE WTX API



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Agenda

1. Weighing 4.0
2. What is the WTX-API?
3. Your way towards weighing 4.0
4. Life Demo

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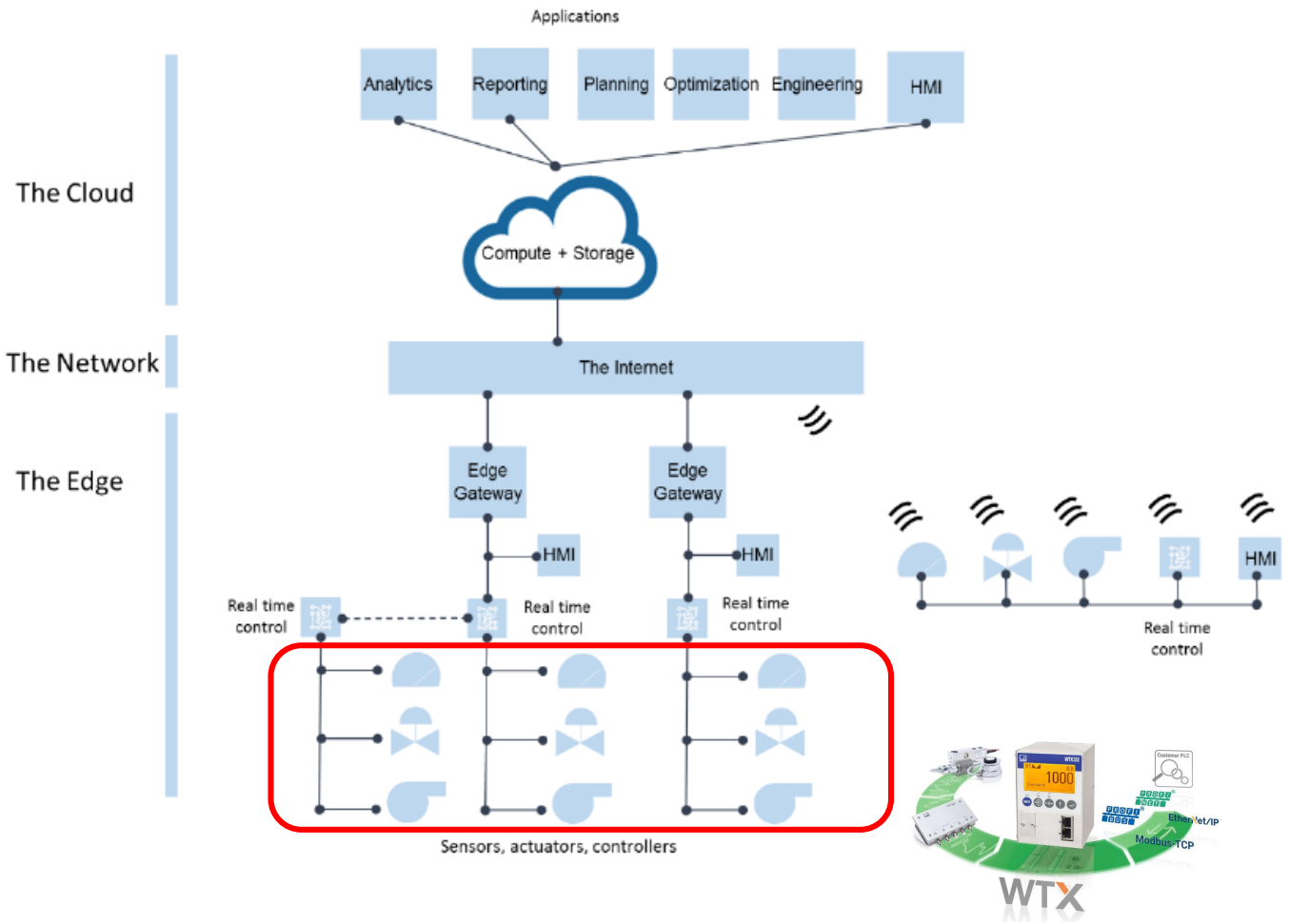
Industrial revolutions

1.	• ~1700 • Water & Steam powered mechanical manufacturing facilities
2.	• ~1900 • Introduction of electrically-powered mass production based on division of labor
3.	• ~1970 • Electronics and IT to achieve automation of manufacturing
4.	• today • Cyber-Physical Systems (Internet 4.0 / Industrial internet of things IIoT)

Where is weighing within the cyber physical system?

- https://en.wikipedia.org/wiki/Industrial_internet_of_things



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Weighing 4.0 – What for...?

- IIoT – Central and decentral accessibility
  - R&D test & optimizing
  - Initial start up / commissioning
  - (Remote) service with status signals and messages
  - Back-Ups or upgrades
  - Cloud access
  - Database-connection, ERP-access, etc.

Weighing 4.0 – And now...?

- Endless possiblities – including Big Data Analysis
  - Do I even need all available data?
  - How can I adapt, structure and scale this data to my needs?
  - Is my data really secure?
  - Is it reasonable for me to invest in Big Data?
  - Which role will notified bodies play int he future in terms of recertification?

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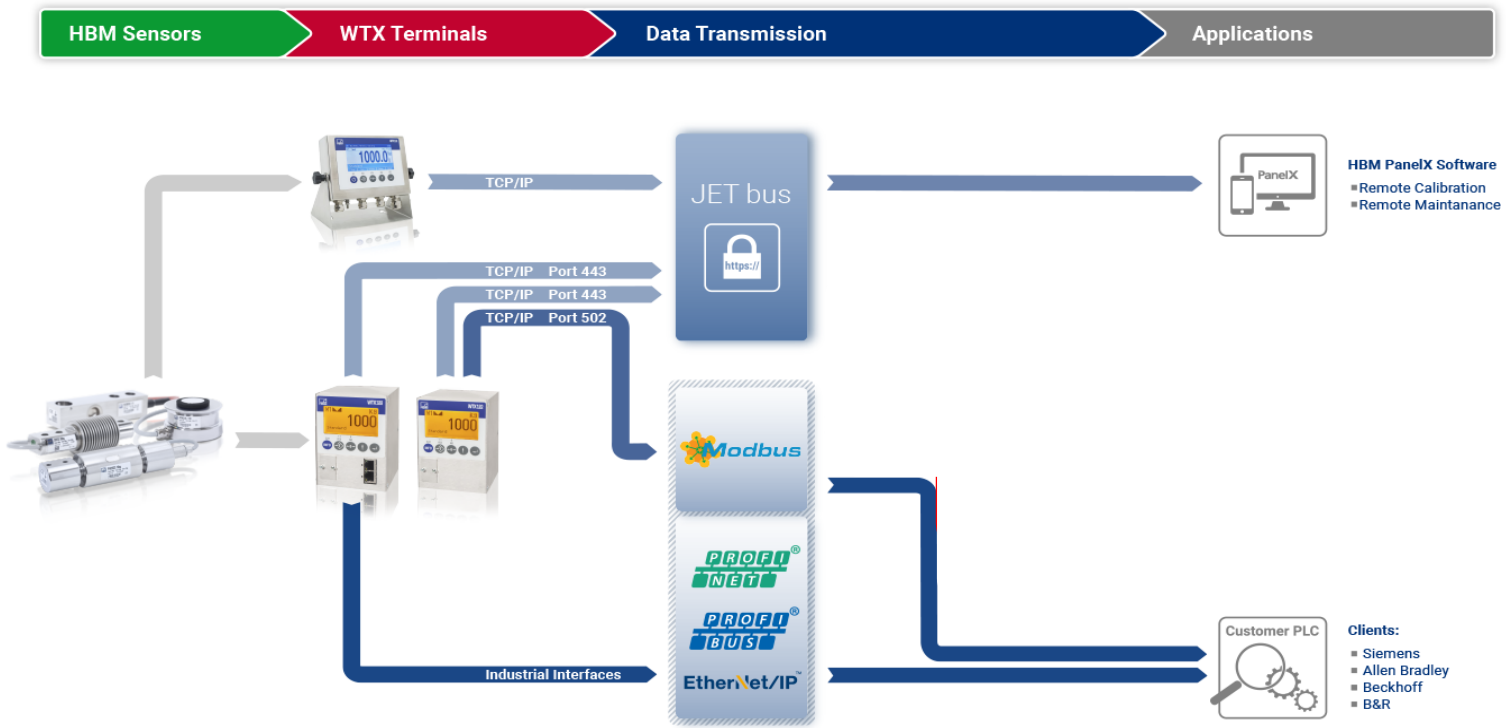
What is the WTX-API?

- The WTX-API is an **A**pplication **P**rogramming **I**nterface
- The WTX-API extends all HBM WTX-containing measuring chains with an Open Source Interface based on Ethernet TCP/IP JET bus and Websockets
- For the WTX-API free and tested source-code templates and programming samples are available
- The WTX-API is fully Open Source (MIT Licence: fully useable, even commercially!)



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The new WTX-API

- Facts & Advantages
  - The API can be used without any additional costs for all WTX terminals
  - The API can be used right now
  - Depending on the device the API can be used in parallel to industrial ethernet communication (i.e. Profinet, EtherNet/IP, Profibus)

HBM Messkette mit WTX110

HBM Messkette mit WTX120

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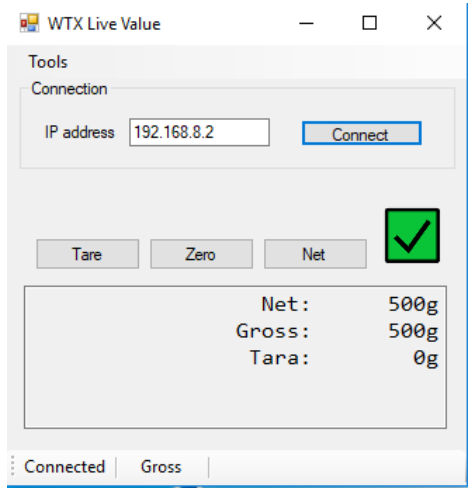
Free open source templates

- More facts and advantages:
  - The API comes with 3 open source (and proven in use) programming-examples
  - Open Source Samples can be adapted to your needs
  - Programming your own app is of course possible as well



„Easy to Start“
For beginners

Input:Word	Input:Name	Input:Type	Input:Bit	Input:Interface call routine
0	Measured Value	Int32	32Bit	IDevice_Values.NetValue
2	Measured Value	Int32	32Bit	IDevice_Values.GrossValue
4	DS461-Weight status	Bit	.0	IDevice_Values.general_weight_error
4	DS461-Weight status	Bit	.1	IDevice_Values.scale_alarm_triggered
4	DS461-Weight status	Bits	2-3	IDevice_Values.limit_status
4	DS461-Weight status	Bit	.4	IDevice_Values.weight_moving
4	DS461-Weight status	Bit	.5	IDevice_Values.scale_seal_is_open
4	DS461-Weight status	Bit	.6	IDevice_Values.manual_tare
4	DS461-Weight status	Bit	.7	IDevice_Values.weight_type
4	DS461-Weight status	Bits	8-9	IDevice_Values.scale_range
4	DS461-Weight status	Bit	.10	IDevice_Values.zero_required
4	DS461-Weight status	Bit	.11	IDevice_Values.weight_within_the_center_of_zero
4	DS461-Weight status	Bit	.12	IDevice_Values.weight_in_zero_range
5	Measured value status	Bits	0-1	IDevice_Values.application_mode
5	Measured value status	Bits	4-6	IDevice_Values.decimals
5	Measured value status	Bits	7-8	IDevice_Values.unit
5	Measured value status	Bit	.14	IDevice_Values.handshake

„Data word structure“
For PLC professionals

```
Options to set the device : Enter the following keys:
b-Choose the number of bytes read from the register |
0-Taring | 1-Gross/net  | 2-Zeroing  | 3- Adjust zero | 4-Adjust nominal |
5-Activate Data          | 6-Manual taring             | 7-Weight storage

Net value:                      999        As an Integer:  999
Gross value:                    999        As an Integer:  999
General weight error:           0          As an Integer:  0
Scale alarm triggered:          0          As an Integer:  0
Scale seal is open:             1          As an Integer:  1
Manual tare:                    0          As an Integer:  0
Weight type:                    gross      As an Integer:  0
Scale range:                    Range 1    As an Integer:  0
Zero required/True zero:        0          As an Integer:  0
Weight within center of zero:   0          As an Integer:  0
Weight in zero range:           0          As an Integer:  0
Application mode:               Standard   As an Integer:  0
Decimal places:                 0          As an Integer:  0
Unit:                           g          As an Integer:  1
Handshake:                      0          As an Integer:  0
Status:                         Execution OK!      As an Integer:  1
Limit status:                   Weight within limits  As an Integer:  0
Weight moving:                  0=Weight is not moving.  As an Integer:0
```

„Console Status“
For specialists

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Predefined functionalities

- The API also comes with predefined functionalities that give you easy and quick access to every function of the WTX

```
1 reference
private void TareButton_Click(object sender, EventArgs e)
{
    _wtxDevice.Tare();
}

1 reference
private void ZeroButton_Click(object sender, EventArgs e)
{
    _wtxDevice.Zero();
}
```

```
ModbusTCPConnection _modbusConnection = new ModbusTCPConnection(this._ipAddress);

_wtxDevice = new WTXModbus(_modbusConnection, this._timerInterval, this.update);
```

The new WTX-API – how secure is my data?

- Device-Identification via Certifiation Authority (CA) is integrated into the WTX
- 2-Way End-to-End encryption via SSL 2.0
- Standard https:// port 443
- Additional security features like passwords, limited number of clients or even locking the device completely

TCP/IP
Port 443

Client(s)
- PanelX
- WTX Mobile
- Cloud Access
- Databases
  - ERP
  - usw.

- ✓ State of the art decentral device access
- ✓ Matches the WELMEC 7.2 Software Guide requirements
- ✓ Future-proof as certificates can be updated

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Weighing 4.0 - Core Elements

- Sensors are the key element!
  - Analog or digital (smart) load cells
  - Weighing terminals for analog or digital load cells
  - Accessories

1. HBM Sensors	3. Accessories	2. WTX Terminals

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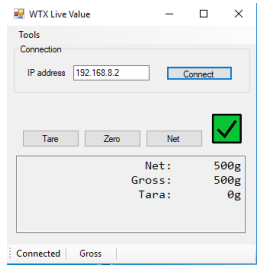
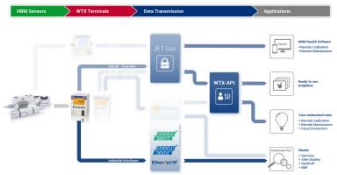
WTX-API – Your way towards weighing 4.0

The path towards your first weighing 4.0 application:

Step 1 Measuring chain	Step 2 Infrastructure	Step 3 Software & API	Step 4 First application	Step 5 Your Future
	• Windows PC • Ethernet TCP/IP • Accessories … Router, Patch cable, etc. • PanelX „Out of the Box“ & free	• Win7, Win10 + .net framework 4.5 • Visual Studio • „Ready to Use“ Samples / Source Code • „Ready to Use“ DLLs	• Aprox. 5 minutes for your first application 	• Cloud Access • Databases • ERP • Big Data • etc.
	 		 	

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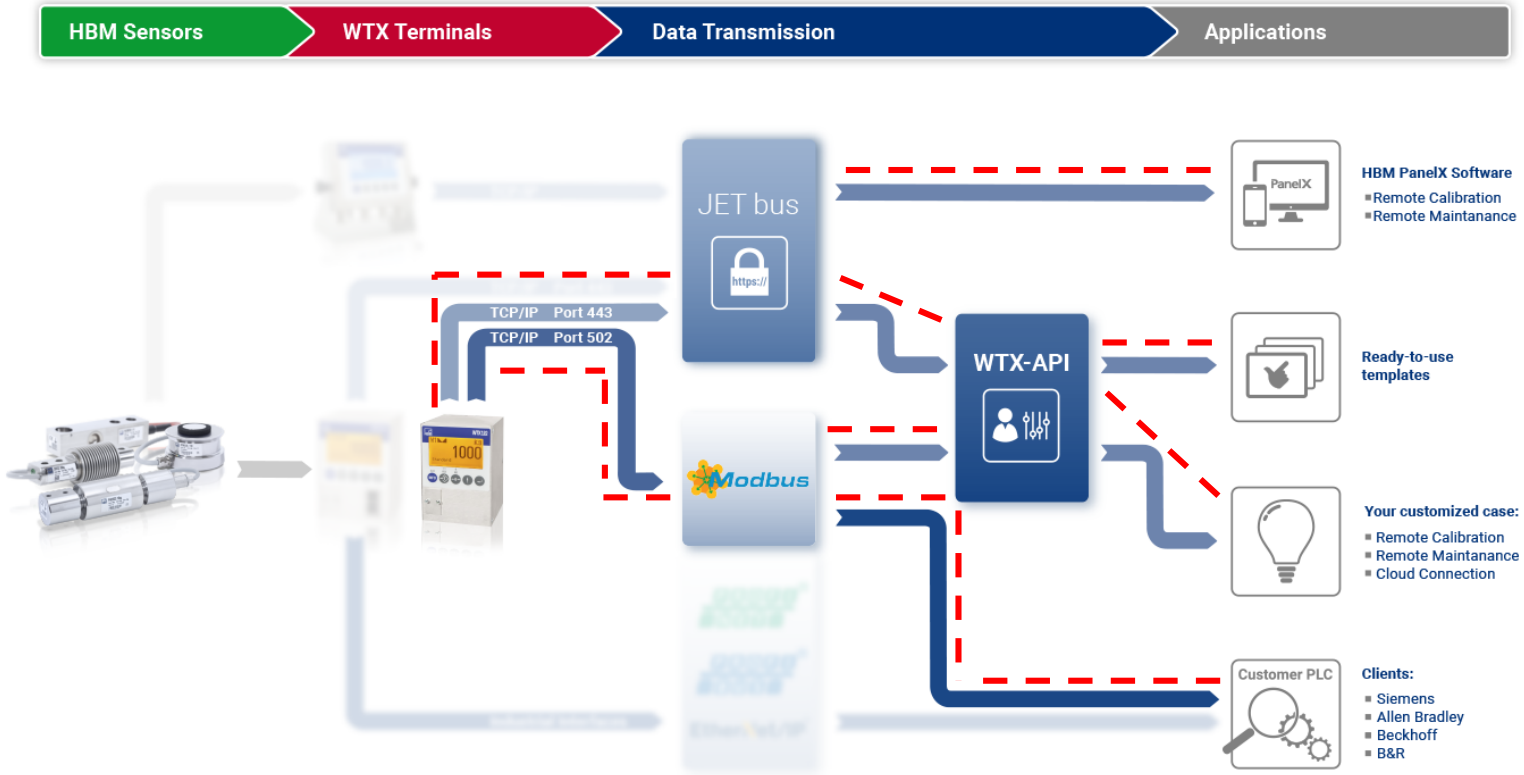
WTX-API – Network structure: Single Channel

Single Channel: TCP/IP for PanelX, Modbus-TCP + WTX-API

- Connectivity to Databases and Cloud, Stand-Alone PLCs etc.
- Simple and scale-able



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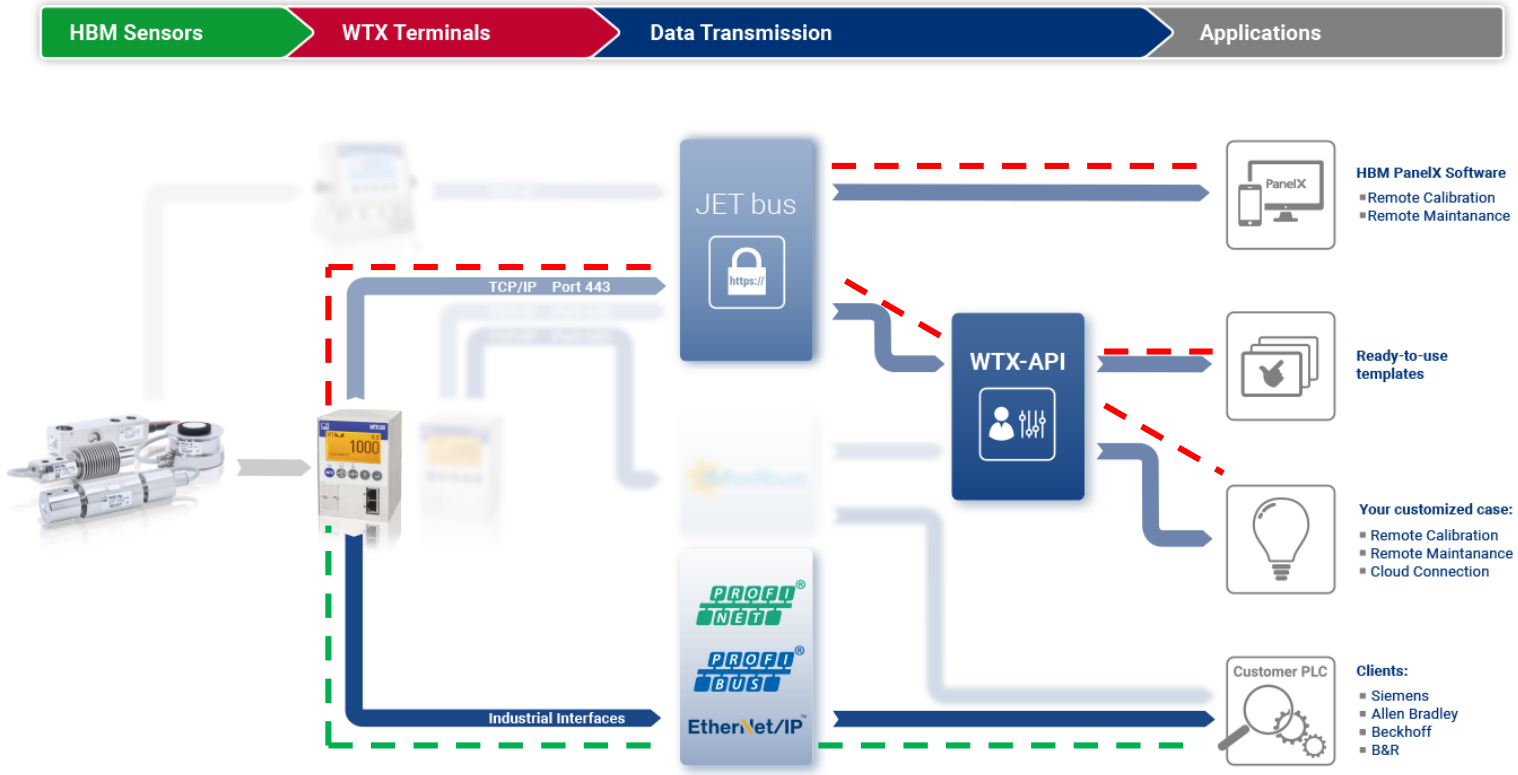
WTX-API – Network structure: Dual Channel

Channel 1: Industrial Ethernet for PLCs and controllers to manage the main application

Channel 2: TCP/IP for PanelX and the WTX-API Remote Calibration, Maintenance, Service and Cloud access



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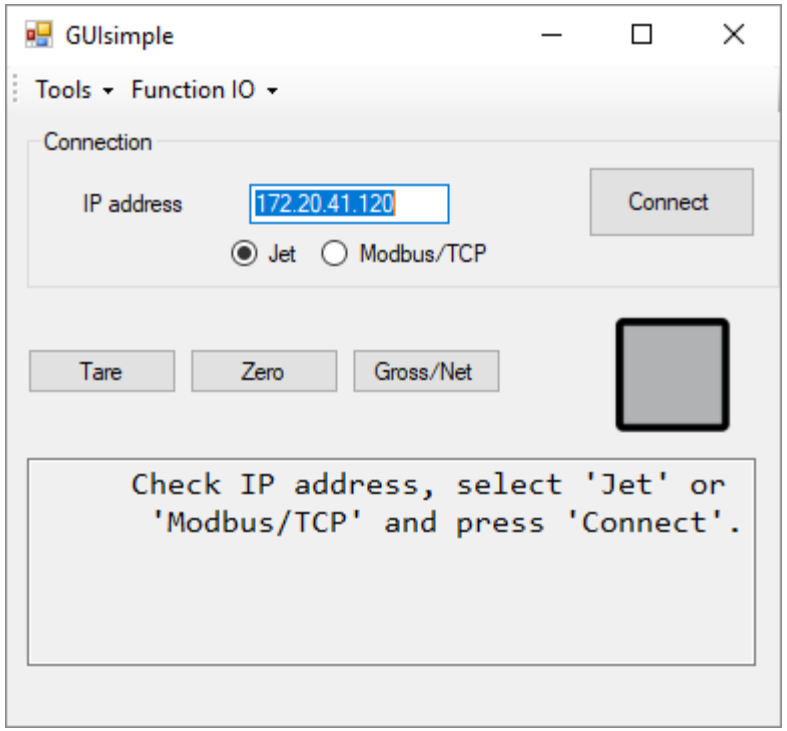
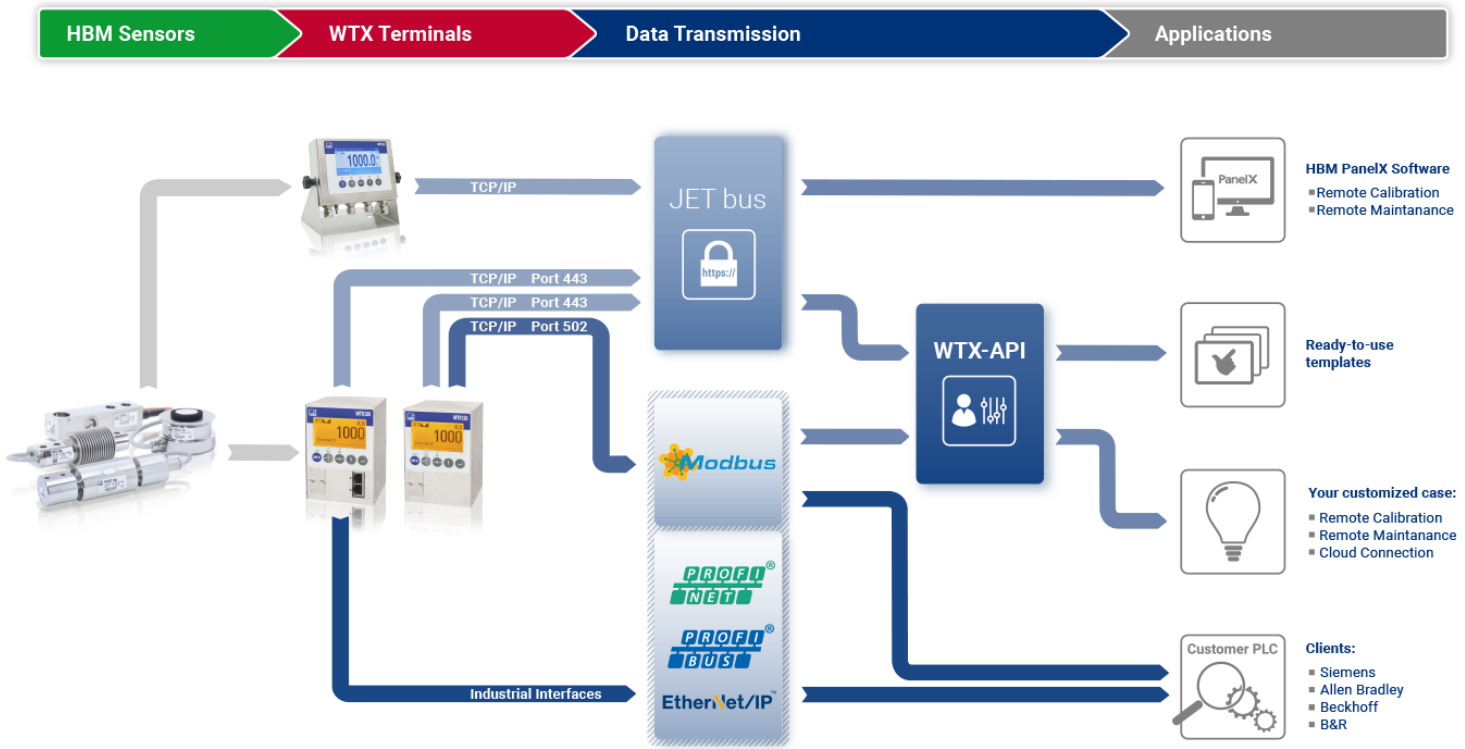
WTX API – Simple GUI App live demo





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Thank You

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