EUROPEAN HEAT PUMP SUMMIT

POWERED BY CHILLVENTA

SYMPOSIUM + EXPO
NUREMBERG, 20–21.10.2015

Industrial | Commercial | Residential
Heating & Cooling | Components & Equipment

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NÜRNBERG MESSE

High
Efficiency
Solutions.

CAREL

Connected world new control solution

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Agenda

1. Market development
2. New c.pCO controller family
3. Onboard connectivity
4. Standard protocols
5. Cloud solution
6. Conclusion

1. Market development

- The market for Smart Home systems is in the growth phase
- Around 2% of new buildings are using Smart Home
- Market will grow around 12%/year until 2020 with an turnover of around 6.9 billion € (study of "trend:research")

1. Market development

- The market for Smart Home systems is in the growth phase
- Around 2% of new buildings are using Smart Home
- Market will grow around 12%/year until 2020 with an turnover of around 6.9 billion € (study of "trend:research")
- Main market: Residential houses
- Main goals: → Energy saving and increasing the comfort
- Communication between different devices for higher efficency
- HVAC device (e.g. HP) change the setpoint based on the temperature, solar production or presence of persons
- Using the cheapest available energy source
- Improve comfort with one platform for all devices

1. Market development

Challenges of Smart Home

- A lot off different providers
- Different communication protocols
- Not easy to combine all devices
- Solution: open connectivity with standard protocols

2. New c.pCO controller family

2. New c.pCO controller family

Main features:

- **Universal channels** (U1..U10) freely configurable

- **From Bios to OS**

  - Multi tasking operating system
  - Protocol management (separated, modular, dynamic)
  - Trend management (separated, thanks to file system)
  - Onboard ethernet

- **Bigger memory**

  - Application files
  - Web pages
  - Documents

3. Onboard connectivity

3. Onboard connectivity

- **5 serial ports**:
  - pLAN
  - BMS (1+1),
  - Fieldbus (1+1)

- **2 ETHERNET ports as native solution:**

- **For variable exchange** between controllers (100 Mb/s, 1500x faster than pLAN)

- **Galvanic insulation**

- **Multifunctionality**: client/server architecture; multi-master and multi-protocol on the same network (variable exchange, tERA connection, Modbus TCP/IP to touch terminal, etc)

- Long **network chains** (with ethernet switch inside)

3. Onboard connectivity

- **New built-in USB solution**

- **two USB ports**

- **USB Host:** to load **updates, licenses** (e.g. BACnet) and **digital signatures**

- **USB Device: a communication port to c.suite** and the **File Storage** as removable media.

- **Speed:** update in just a few seconds

3. Onboard connectivity

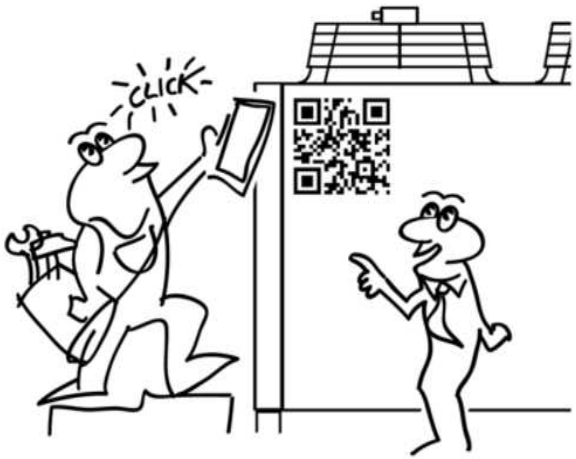
- **Native WiFi interface**

- **Client mode**

  - WiFi infrastructure already in place
  - c.pCO connects to existing Access Point

- **AP mode**

  - c.pCO acts as Access Point
  - Tablets and smartphones will browse c.pCO Web interface



4. Standard protocols

Modbus

CAREL

ASHRAE BACnet™

SNMP

KNX KONNEX

MP BUS® TECHNOLOGY BY BELIMO

CAN

4. Standard protocols

➢ **Available protocols via Ethernet port**

✓ HTTP Server
- Custom HTML pages
- Dynamic content (CGIs)

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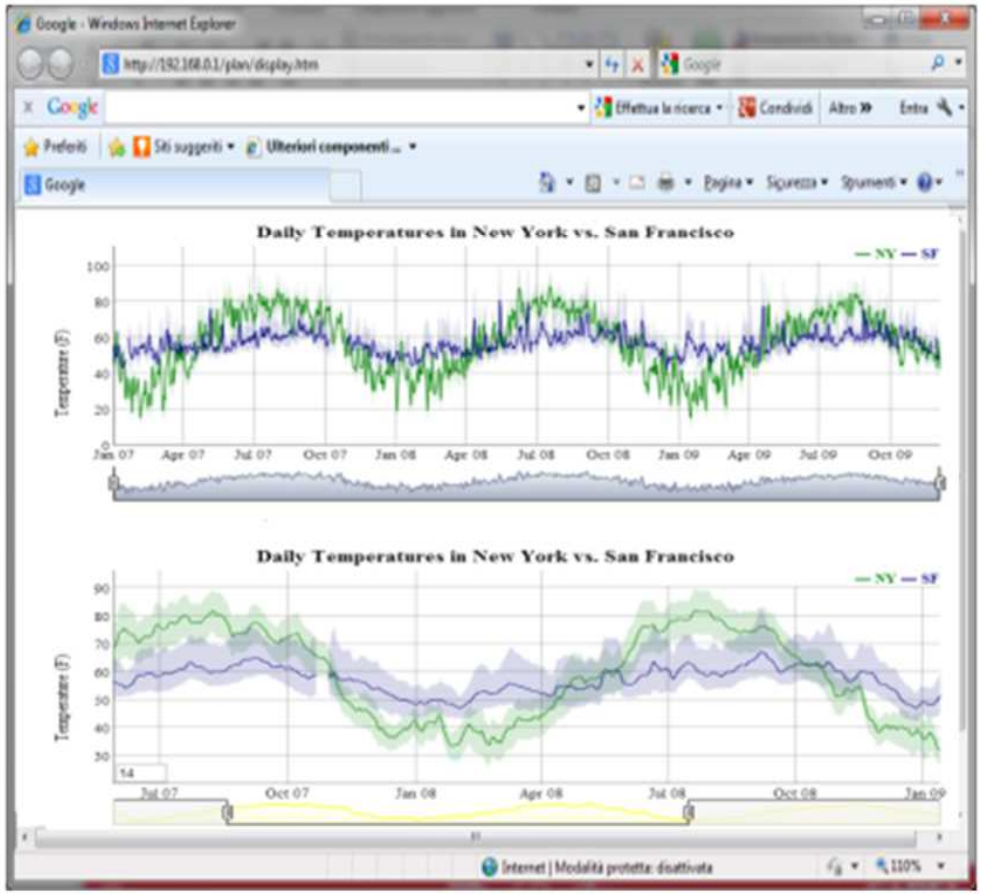


4. Standard protocols

➢ **Available protocols via Ethernet port**

✓ HTTP Server
- Custom HTML pages
- Dynamic content (CGIs)
- Application upgrade
- Web pGD interface
- Web charts from log data

✓ BACnet TCP/IP
- BACnet BAC & BBC

✓ Modbus TCP/IP
- Master/Slave

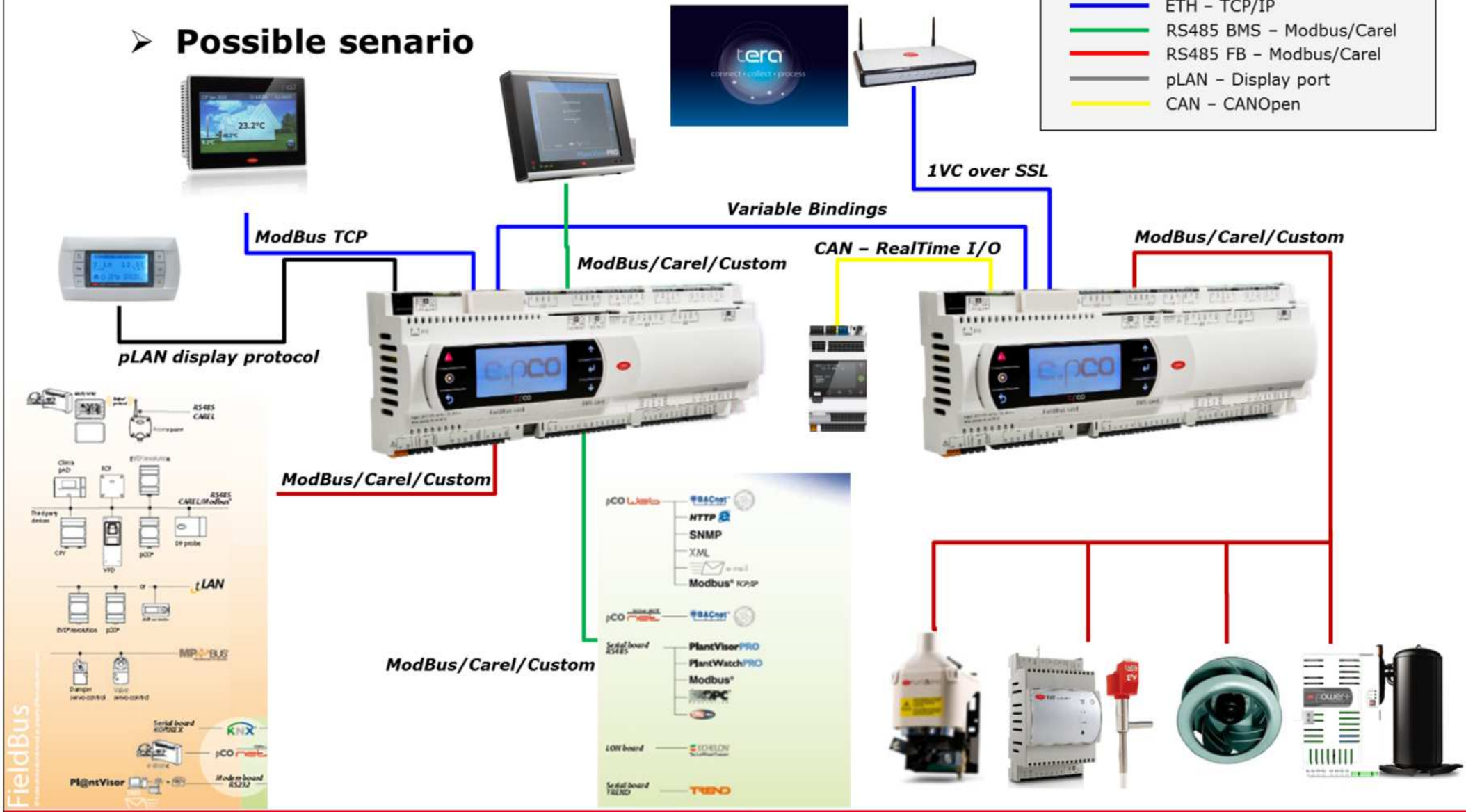
✓ FTP Server
- Application upgrade
- Custom file upload
- Log download

4. Standard protocols

- **Available protocols via Serial Ports**
- pLAN (onboard) communication to displays, ModBus RTU Slave
- BMS2 (Onboard): ModBus RTU Salve, BACnet BAC & BBC
- FB2 (Onboard): ModBus RTU Master, BACnet BAC & BBC
- BMS1 (optional card): ModBus RTU/TCP IP, BACnet, KNX, LON
- FB1 (optional card) ModBus RTU, KNX, MP Bus

4. Standard protocols

➢ **Possible senario**



5. Cloud solution

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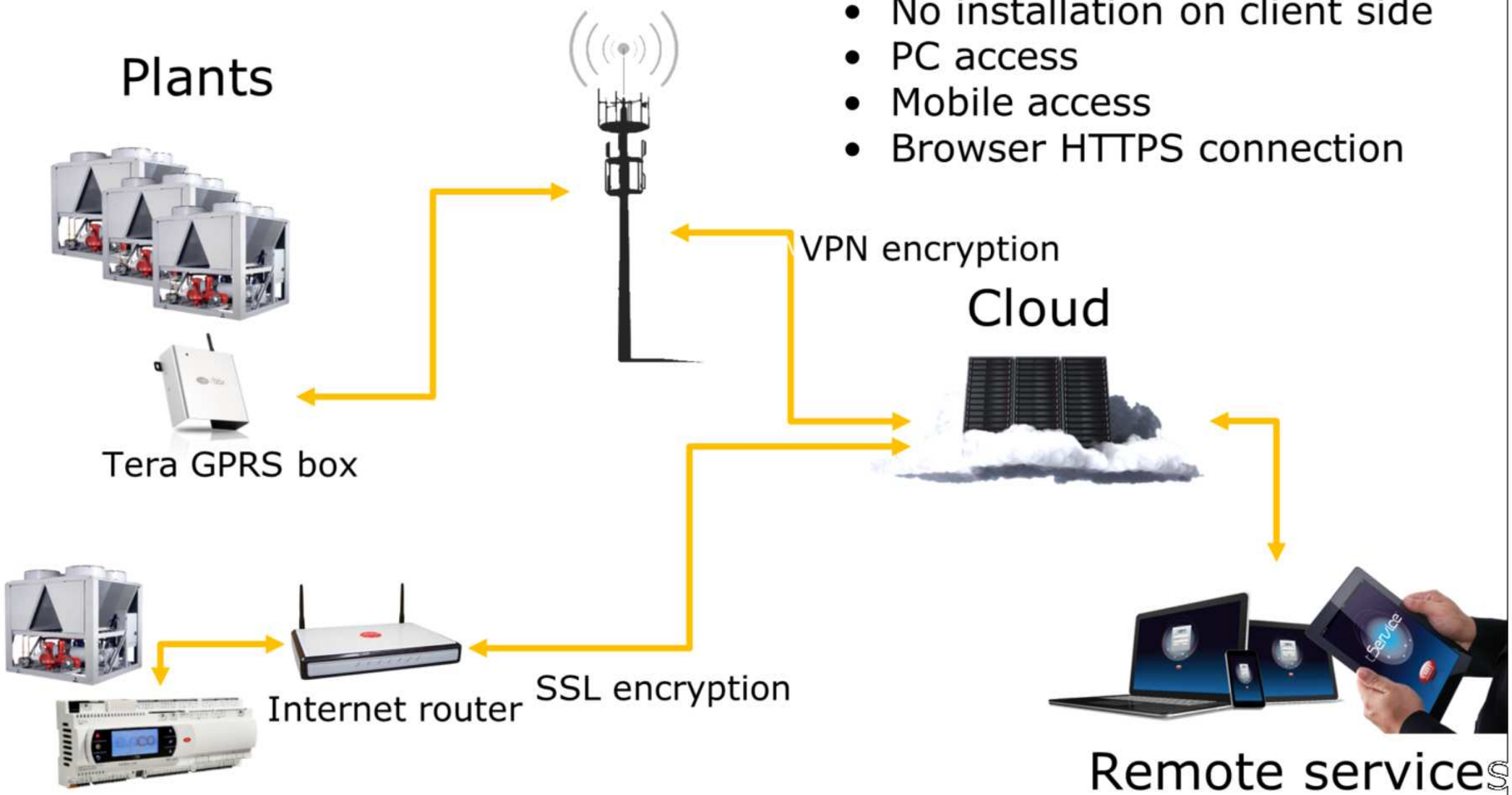
tERA is the cloud solution from Carel

- Designed for End User, Installer/ Maintainer and OEM
- Always connected to the plant
- Easy access via Webportal or App
- Secure connections: strict security standards (NIST)

5. Cloud solution

- No installation on client side
- PC access
- Mobile access
- Browser HTTPS connection



5. Cloud solution

Energy cost reduction:

- Plant parameters detection and autotuning
- Adjustment based on:
  - Weather forecast
  - Smart Grid (Energy cost time bands)
  - User input (Comfort, economy,…)
- Consumption report as education for efficient usage

5. Cloud solution

Smart Service: machine status control

- Alarm notification
- Troubleshooting & FAQ
- Service calls

5. Cloud solution

Benefits for OEM

- **Warranty management:**
  - Direct management of claims
  - Remote upgrade of application SW

- **Marketing dashboard:**
  - Installation distribution based on geolocalization/ machine type / installer team…

6. Conclusions

- The Smart Home market will grow a lot
- Connectivity getting more and more important in the future
- OEMs have to offer Smart System Solutions instate of units
- Cloud computering is a chance to offer also services
- Integrated connectivity with standard protocols is needed

thank you for your attention,
any questions?

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