

# Secure remote Connectivity



# Presenter Profile



**Christoffer Karlsson**



**Organisation** Siemens Australia

**Job Function** Product manager – Industrial Communication



# Introducing Siemens Industrial Communications Team....



Serge Maillet  
Portfolio Sales Team Lead



Ken Yip,  
BDM Ruggedcom



Christoffer Karlsson  
Product Manager



Varoon Ashok  
FAC

## Professional Services Team



Pawel  
Krzysztofik



Paul  
Zhang



Peter  
Jerusalem



Bradley  
Wilson



Gabriella  
Swaby



Dylan  
Read

## Support capabilities:

- Network & Security Audits
- Trainings
- Design and Commissioning services
- Tender support
- Technical clarifications
- Pre- sales support
- Proof of concepts
- Seminars
- Workshops

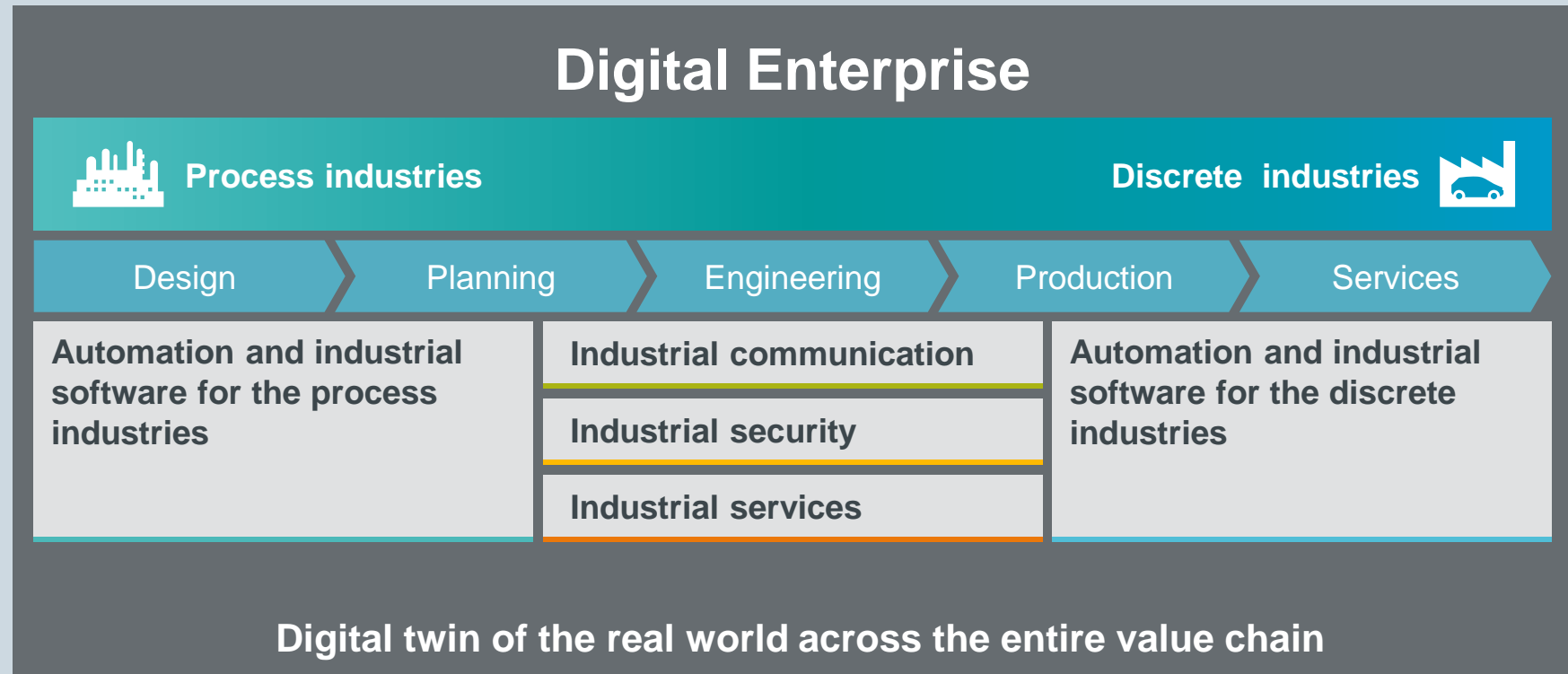
# Driving the digital transformation of discrete and process industries with Siemens Digital Industries



Digitalization

Automation

Electrification







# Digitalization changes everything

And the right communication networks enable you to be ready for it!

# Digitalization will change the way you work...

## Yesterday Non-digital industry

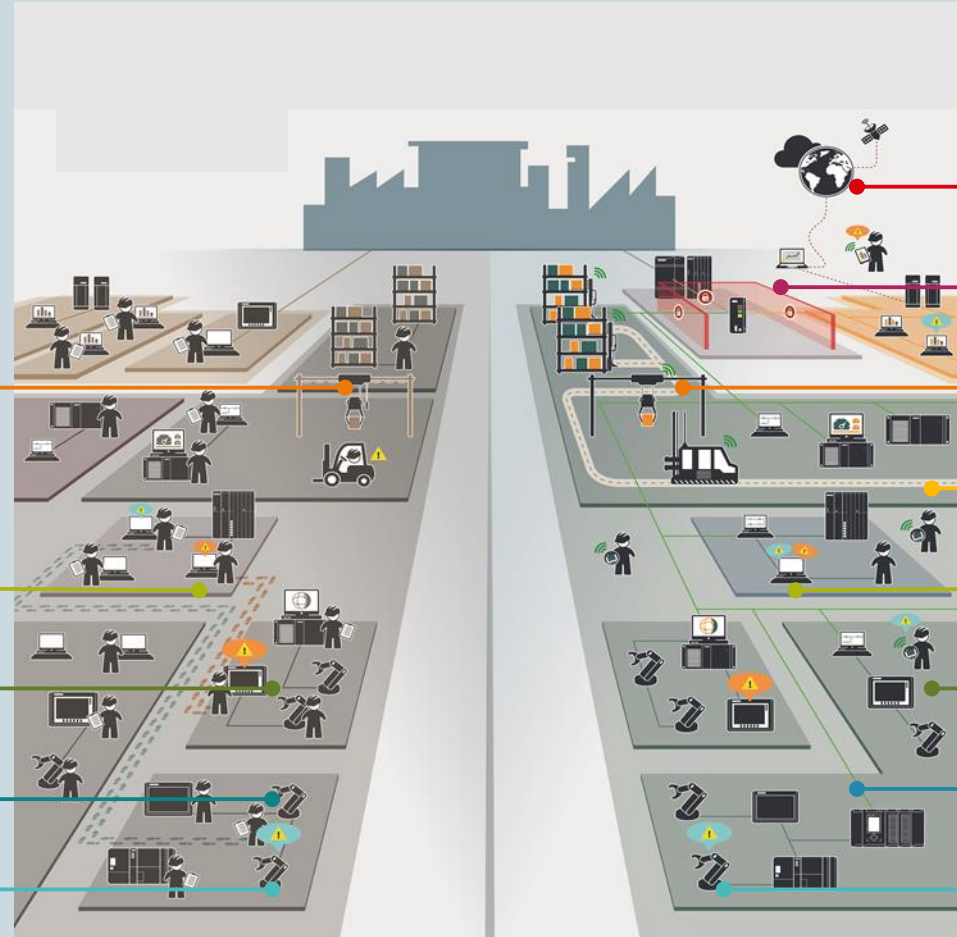
Manual processes

Intransparent processes

Separated islands of automation

Legacy systems

No central alarms



## Tomorrow Digitalized manufacturing

Secured remote access

Industrial security

Full automation

Mobile applications

Full process transparency

Interoperability of processes

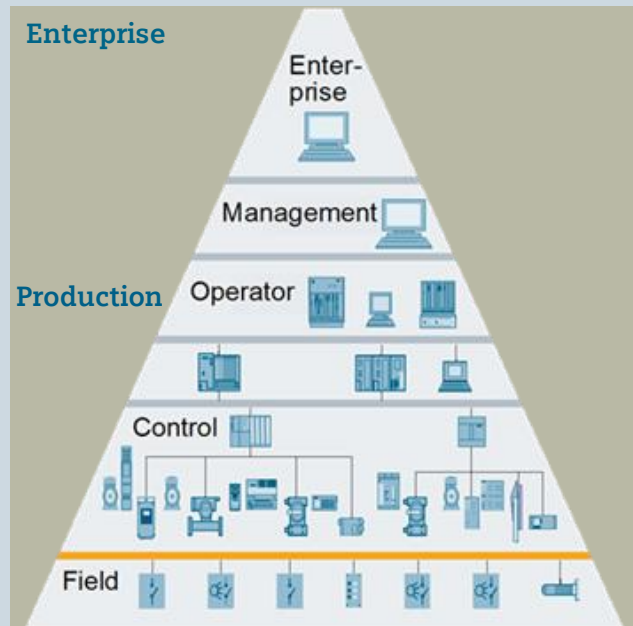
Vertical integration

Central alarm reporting



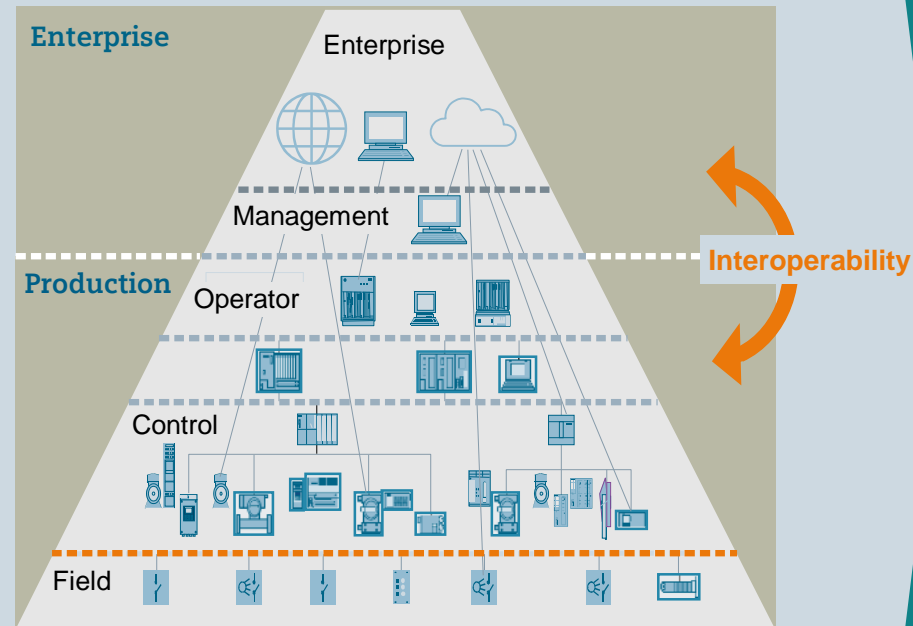
# Digitalization results in enterprise and production layer to get closer connected

Yesterday:  
Limited interoperability



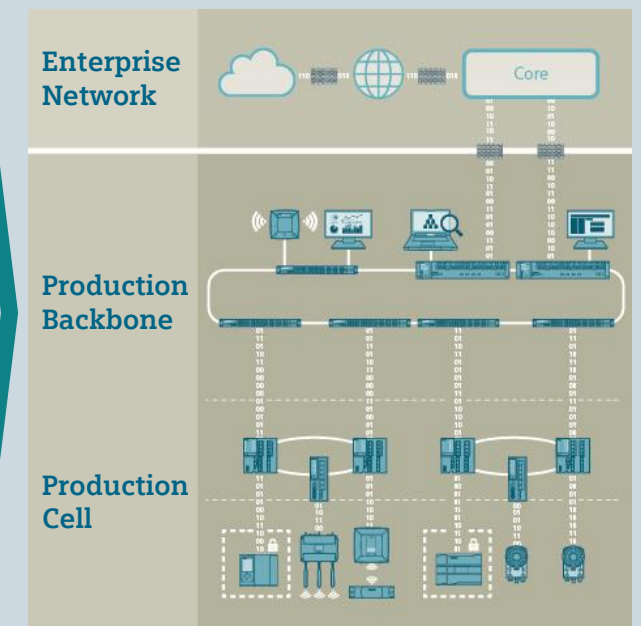
Limited communication between  
enterprise and production layer

Today: Arising challenges through  
increasing interoperability



Challenge to handle complexity of  
increasing communication

Future: Defined interface to  
handle complexity



Two dedicated networks with  
defined managed interface

# Our product range for remote access solutions covers all areas of application

## Industrial Remote Communication

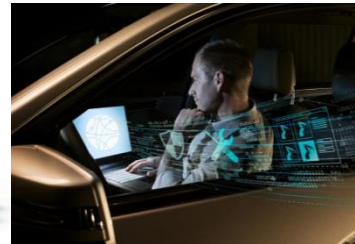
### Permanent connectivity

- Permanent point-to-point connection
- Low bandwidth requirement



### Spontaneous connectivity

- Establish connection on demand
- Medium bandwidth requirement



### Other applications (Smart grid applications, video monitoring, ...)

- Permanent/on demand connection
- High bandwidth requirement



## Remote Networks

Remote communication via private and public heterogeneous networks

## Integration into the industrial security concept



# Solutions for remote access

## Simple operation

- Control systems for process control
- Remote programming and diagnostics



## Security and availability

- Redundancy
- Security integrated: firewall & VPN



## Integrated RTU concept

- SIMATIC based modular RTUs and compact battery operated RTU's
- Various protocols
- Convenient engineering



## Cost reduction

- SCADA solutions, teleservice systems and network components from a single source



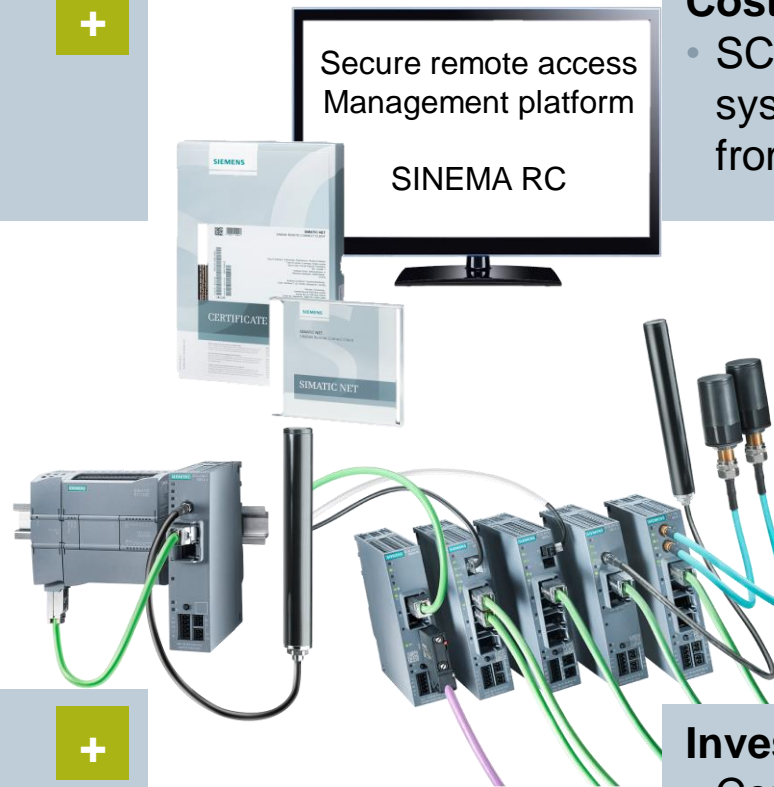
## Fast integration

- Network management
- Standard interfaces
- Software tools
- Integration in TIA Portal V16



## Investment protection

- Compatibility with previous and future system solutions
- Migration concepts



# Industrial Remote Communication portfolio: Use in a wide variety of industrial environments



## Complete SCADA solutions for water and energy

- Wide-ranging RTU portfolio based on SIMATIC S7
- Simple and redundant communications via heterogeneous networks
- Intelligent control systems based on PCS 7, WinCC and WinCC OA



## Remote access to machinery and plants

- Secured teleservice access using VPN and firewall
- Simple access to serial machines via the SINEMA Remote Connect management platform



## The right transmission for any communication

- A complete range of products for wireless connections and landlines
- High security standards
- Flexible modular system for networks

# Industrial Security concept Siemens

## Defense in depth according to IEC 62443



Further information: [www.siemens.com/industrialsecurity](http://www.siemens.com/industrialsecurity)



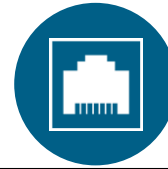
# SCALANCE – Industrial Communication portfolio



## SCALANCE: Industrial Communication proved to enable communication in production

- **High availability**  
based on industrial features and industrial design
- **Fast & easy integration**  
for new and existing networks based on TIA design
- **Easy to use**  
with configuration via Web Based Management or TIA Portal
- **Easy device replacement**  
with C-PLUG, also by untrained staff
- **For all Ethernet networks**  
local, wireless and remote

## Our Portfolio



### Wired

- Industrial features
- Industrial design
- Fast & easy integration



### Remote / SCALANCE M

- Different medias (DSL, UMTS, LTE)
- Transparent connectivity
- Easy enrollment with SINEMA RC



### Wireless

- Indoor and outdoor applications
- Several country approvals
- Real-time capability



### Security / SCALANCE S

- Firewall & VPN
- Remote access
- Fits to industrial security concepts



### Software

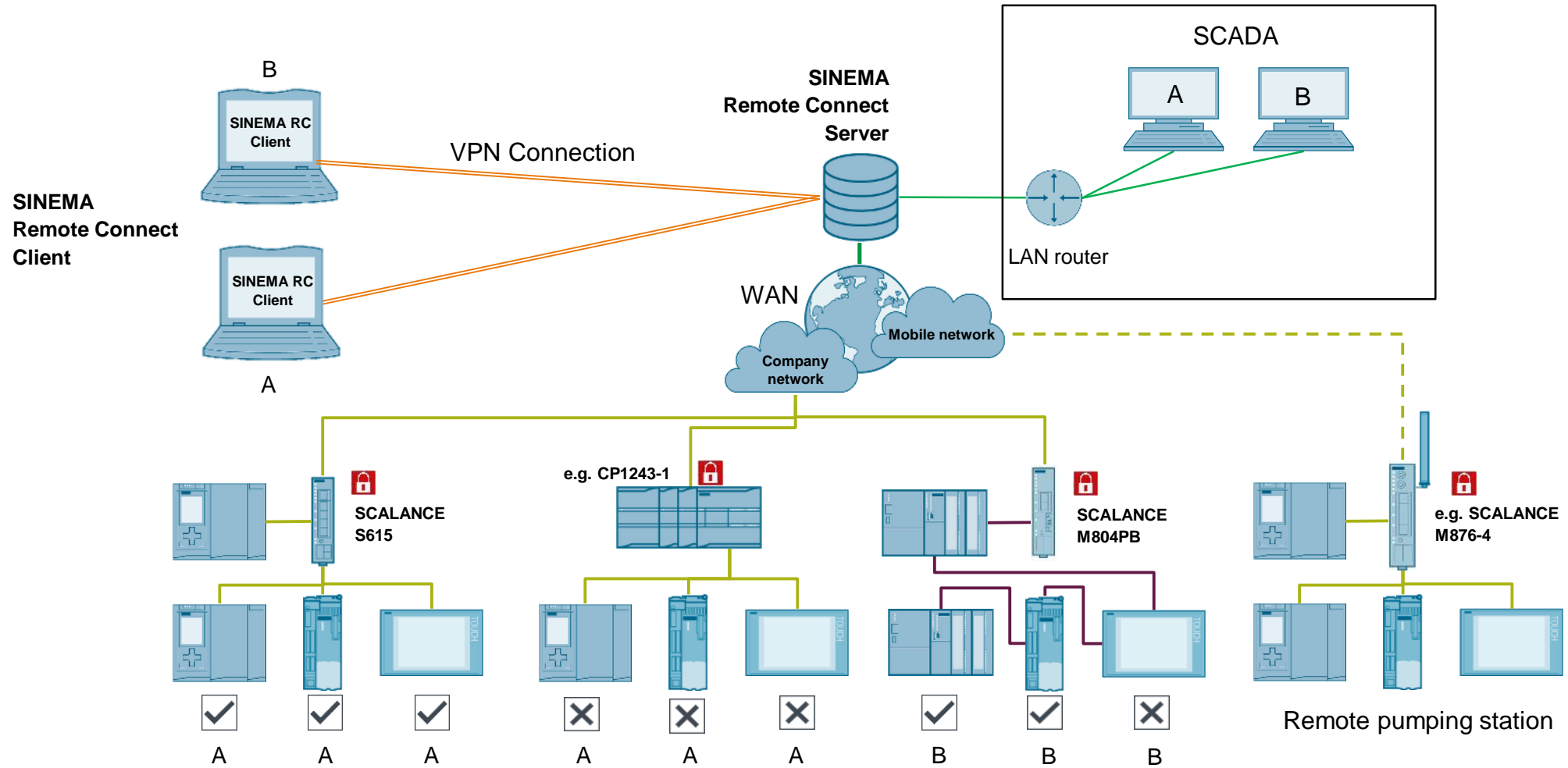
- Transparency for the industrial network
- Integration into HMI / SCADA systems



# SINEMA Remote Connect

Remote maintenance and remote control with ease....

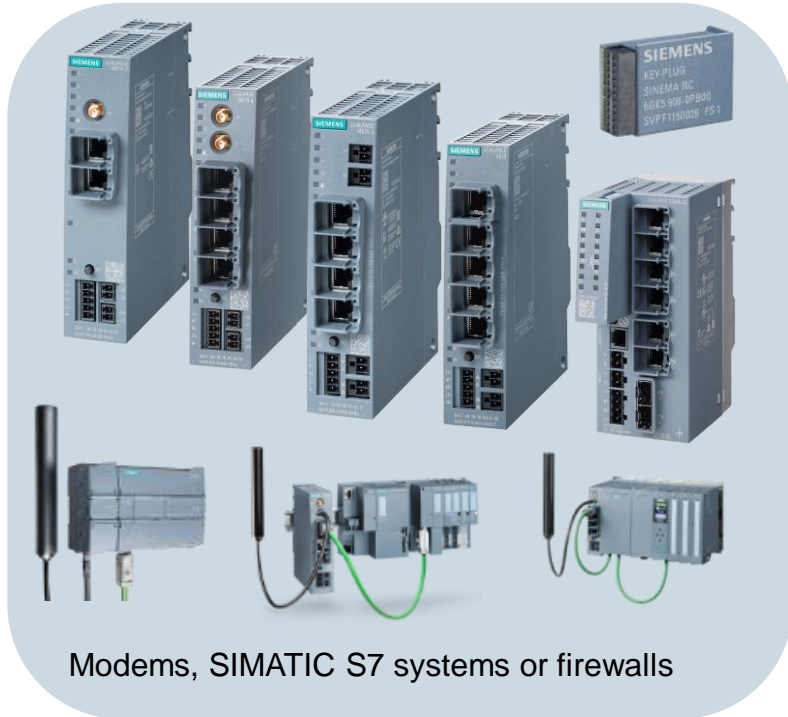
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# SINEMA Remote Connect Step-by-step implementation



## 1. Select hardware for remote location



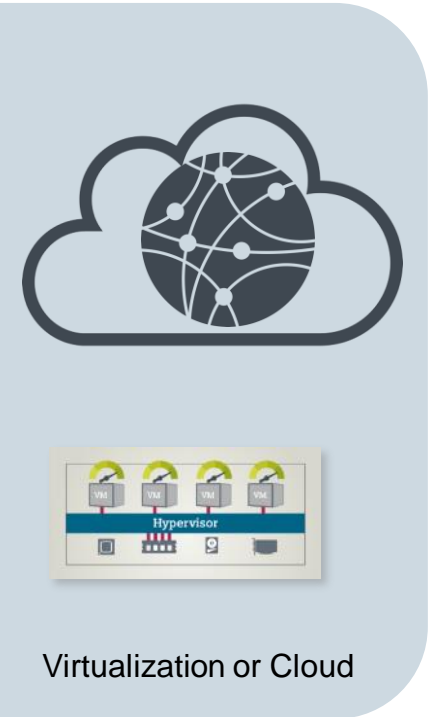
## 2. Accessories



## 3. Software



## 4. Software location



Remote access from TIA portal with SINEMA RC/ works as independent software side by side



# SINEMA Remote Connect Server Functions



## Management of devices and users:

- User management with the configuration of rights
- Device and user management with group management

## Connection management:

- Establishment of encrypted connections with OpenVPN and IPsec
- Establishment of permanent or event-based connections (establishment by wake-up SMS or digital input (DI))

The screenshot displays the 'Geräte' (Devices) section of the SINEMA Remote Connect web interface. It features a sidebar with navigation options like 'System', 'Fernverbindungen', 'Geräte', and 'Sicherheit'. The main area contains a table with columns for device name, IP address, status, and connection details. Below the table are buttons for 'Erstellen' (Create) and 'Löschen' (Delete).

Name des Geräts	VPN-Adresse	Externes Subnetz	Virtuelles Subnetz	Status	Datum der letzten Anmeldung	Standort	Verbindungsart	VPN-Protokoll	Aktionen
Location046	172.30.0.6	192.168.146.0/24	-	Online	24. Mai 2019 10:15	PSS-Büro	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
Location10_1	-	192.168.10.0/24	172.17.1.0/24	Offline	4. April 2018 09:17	Location10_1	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
Location10_2	-	192.168.10.0/24	172.17.2.0/24	Offline	4. April 2018 09:18	Location10_2	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
MS76_WeatherCa	172.30.0.4	192.168.20.0/24	-	Online	26. März 2019 10:33	PSS office Karlsruhe	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
Remote_MPL_CPU	172.30.0.5	192.168.1.0/24	-	Online	26. März 2019 10:33	PSS-Büro	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
RemoteDiag	172.30.0.7	192.168.200.0/24	-	Online	13. September 2019 03:42	PSS office Karlsruhe	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
S615Camera	172.30.0.3	192.168.10.0/24	172.17.10.0/24	Online	26. März 2019 15:56	PSS office Karlsruhe	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
SO636_ARUBA	-	192.168.51.0/24	-	Offline	17. November 2018 12:02	TechAndSales Berlin	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
SO646_MVS40	-	192.168.41.0/24	-	Offline	13. Dezember 2018 02:07	TechAndSales Berlin	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
Schutzanlage	-	192.168.2.0/24	-	Offline	9. Januar 2019 00:32	-	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️
Test60	-	192.168.60.0/24	-	Offline	16. Dezember 2018 09:28	-	Dauerhaft	OpenVPN	🔍 ⚙️ 🗑️



# SINEMA RC Client Functions



## Establishment of a remote connection:

- Direct connection to SINEMA RC server and the remote location
- By issuing a wake-up SMS (in connection with mobile routers SCALANCE M874/876)

## Security mechanisms

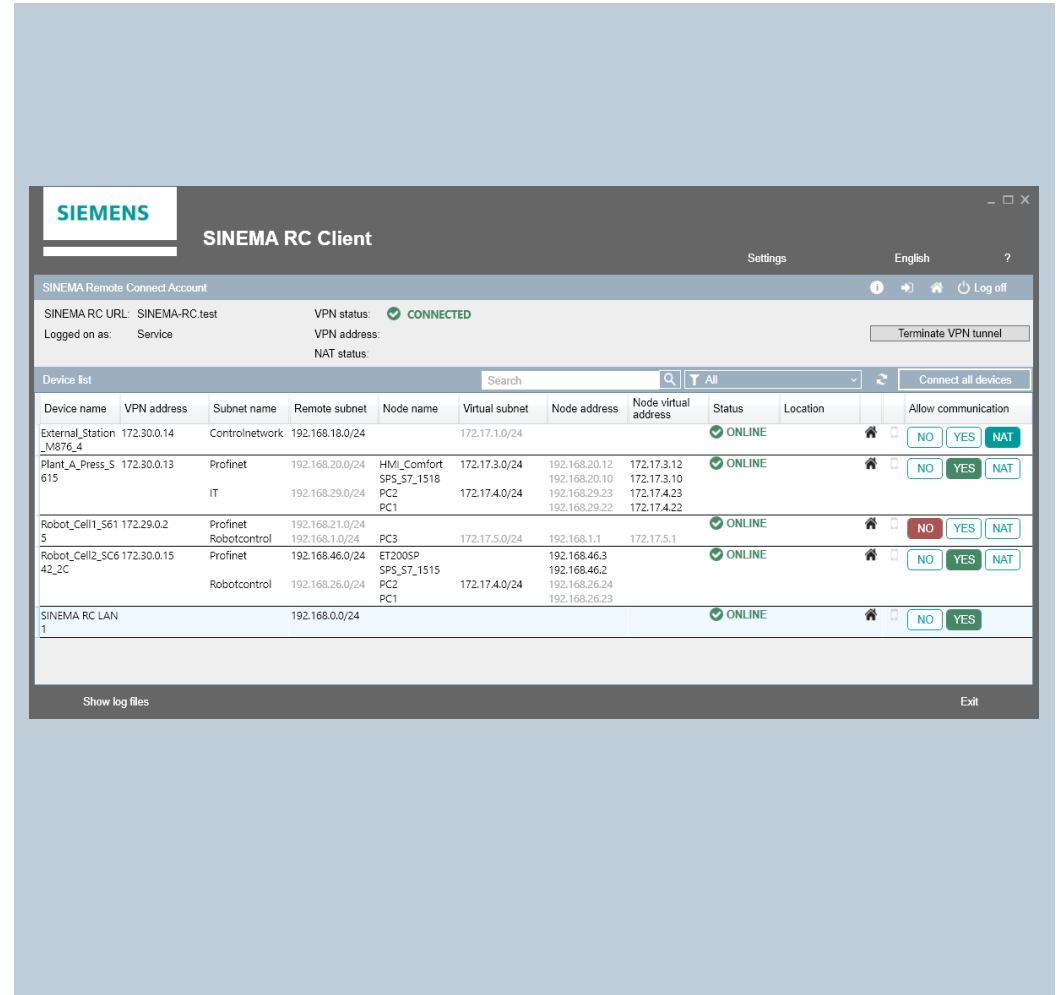
- Tunnel encryption with OpenVPN

## PKI smart card login (optional):

- With two-factor authentication by smart card and key

## Usability:

- Flexible display of information and saving of user-specific view. IP addresses that cannot be reached are grayed out.



# SINEMA Remote Connect use case

## Secured connection by means of security mechanisms (VPN)

### Task

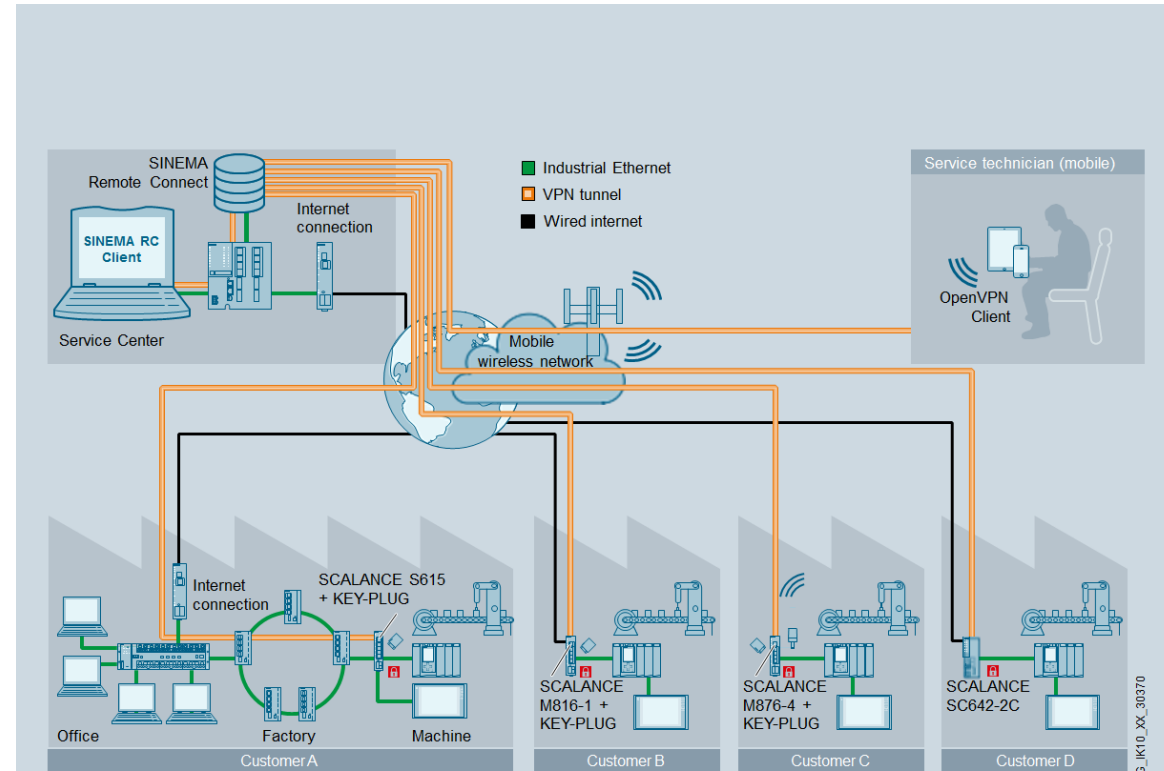
- Remote maintenance of machines and larger plants
- Accesses to the machines/plants/system are protected by security mechanisms (OpenVPN, IPsec)

### Solution

- Easy creation of devices with routing/ NAT information in SINEMA Remote Connect
- Simple selection of a device from the list of devices in SINEMA RC Client by mouse click
- Industry routers and service technicians can separately set up a secured connection to the SINEMA Remote Connect server
- SCALANCE M and S devices support firewall and VPN

### Benefits

- Time and money saved
- Can be used without specialized IT knowledge
- Flexibility through easy expandability
- Transparent IP communication
- Prevention of manipulation and unauthorized access by means of secured data transmission and authentication



**Configuration example SINEMA Remote Connect:**  
**Secured connection by means of security mechanisms (VPN)**



# SINEMA Remote Connect use case

## Secured access to Siemens RTU's with DNP3

### Task

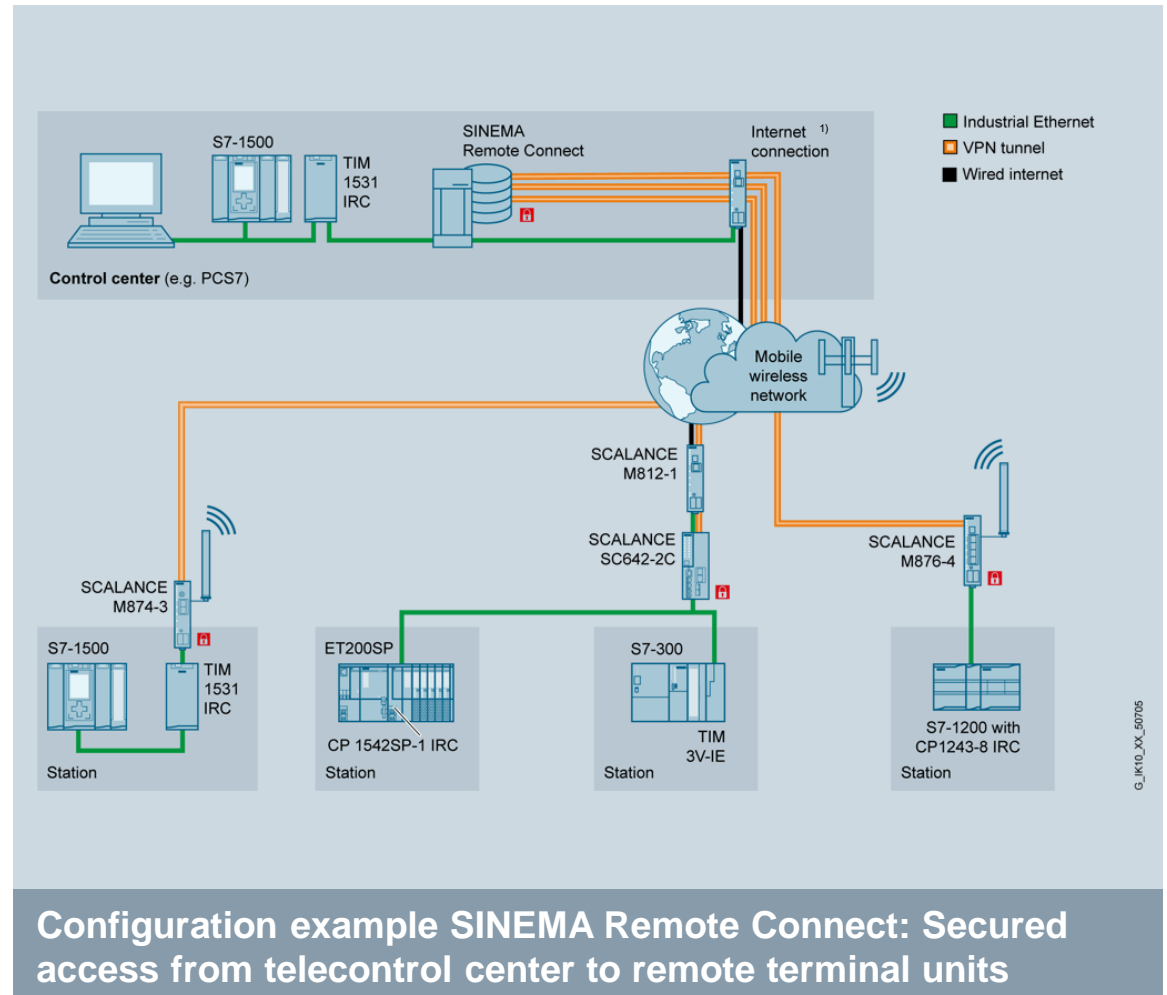
- Telecontrol plant with encrypted connections to the remote terminal units

### Solution

- Telecontrol server and SINEMA Remote Connect server are available in the telecontrol center
- All secured VPN connections managed by means of SINEMA Remote Connect
- Local connection of the telecontrol center to SINEMA RC
- Telecontrol accesses to remote terminal units via SINEMA RC

### Benefits

- Use of standardized encryption protocols
- Direct connection of the control center to SINEMA Remote Connect without additional security components (in the control center)
- Simpler administration because SINEMA Remote Connect server and telecontrol server are at a single location



# SINEMA Remote Connect use case

## Remote service with SCALANCE M804PB and Step 7

### Task

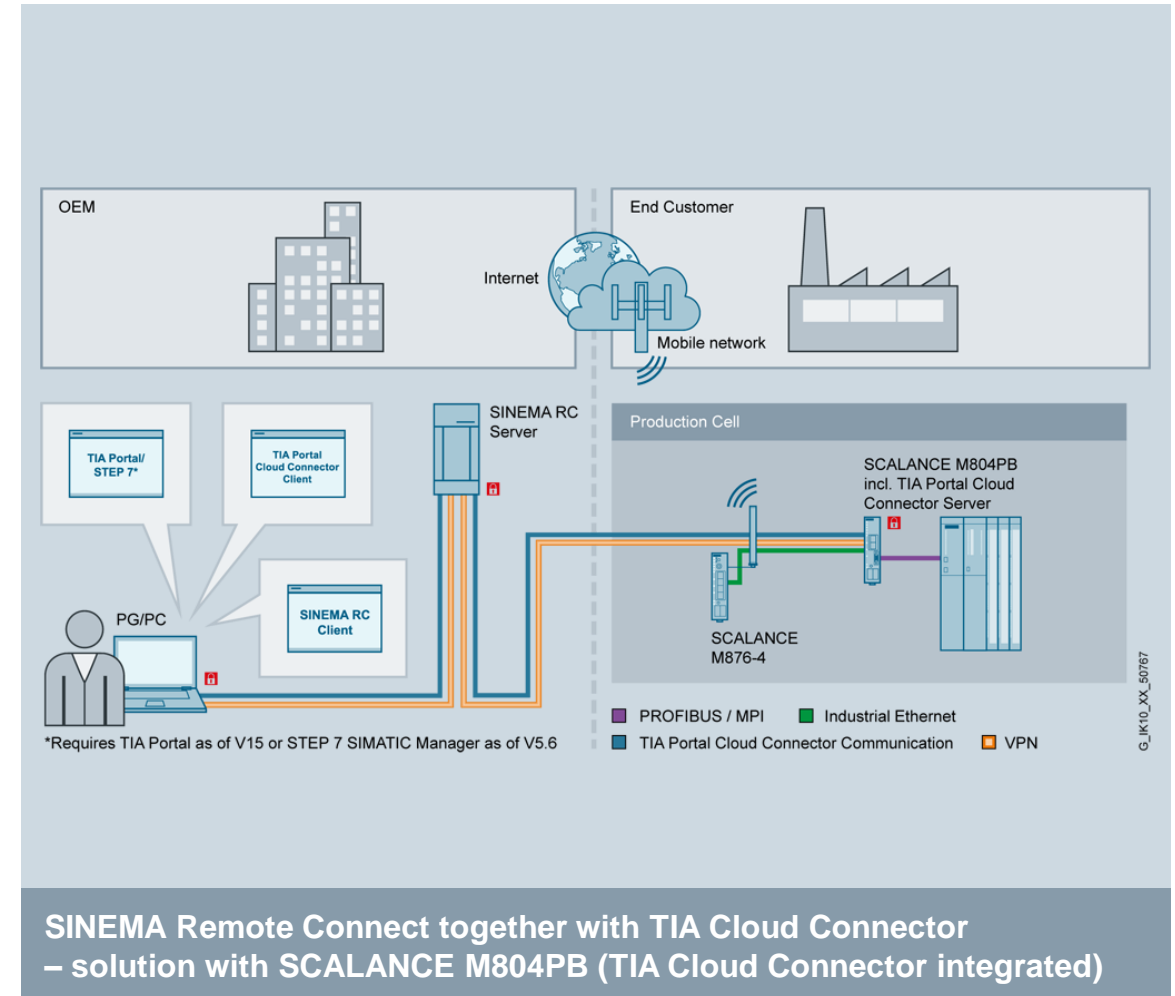
- Remote service with remote access for PROFIBUS via MPI: A service technician is to access a PROFIBUS plant from outside the company network

### Solution

- Connection of PROFIBUS/MPI plants over SCALANCE M804PB that is connected to the production cell over MPI
- Easy configuration and management of the VPN tunnels with the SINEMA Remote Connect management platform enables secure remote access to the plant

### Benefits

- Remote Access on machines and plants with PROFIBUS/MPI reduces time and costs for on-site operation
- Easy connection of consiting plants
- Prevention of manipulation and unauthorized access thanks to secure data transmission and authentication



# SINEMA Remote Connect Getting started....



Promotional package

## SINEMA RC Wireless (4G/ LTE)

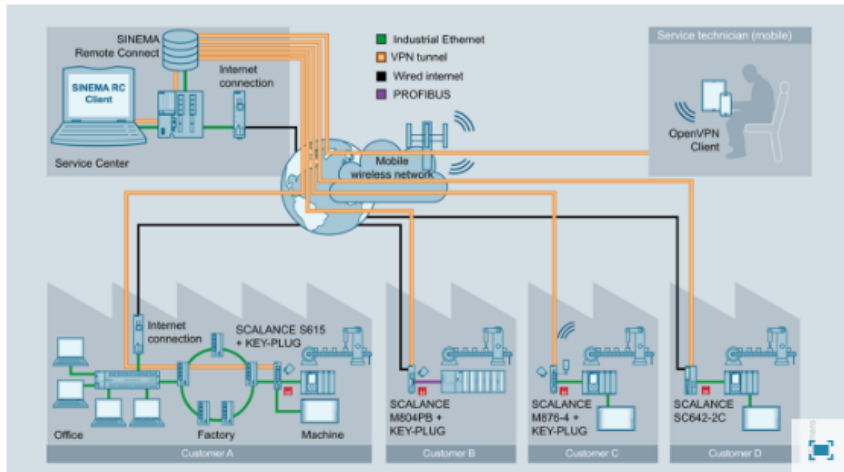


- SINEMA Remote Connect
  - Basic software for 4 VPN connections
  - SINEMA RC Client
  - License key on USB stick
- SCALANCE M876-4 (EU) industrial router (4G)<sup>2)</sup>
- KEY-PLUG SINEMA RC
- Direct-mount antenna
- Remote antenna with 5m cable

Article No. 6GK1720-OAP03

Price: please ask your sales representative

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## Application example

With SINEMA Remote Connect, machines from serial production can easily be connected via remote access – even if they have identical IP addresses. SINEMA Remote Connect offers NAT functionality for this purpose. Users can conveniently connect any machine via an address book function. Dedicated Device Access allows only authorized users to access selected machines.

<https://support.industry.siemens.com/cs/gb/en/view/109479599>



# SINEMA Remote Connect



## Summary of advantages

- **High security with maximum flexibility**
  - Full end- to- end encryption
  - Unlimited number of connections / devices, infinitely scalable
  - Controlled enabling / locking of the maintenance object
- **Advanced security functionality and process maturity**
  - Connection to central user management (UMC server, optionally supplied by MS Active Directory)
  - Two-factor authentication through PKI smart card and key
  - Secure development process to IEC 62443-4-1)
- **Direct support and very high functionality**
  - Consultation and support during system setup
  - Support of common / established VPN standards
- **Integrated Siemens network**
  - Reliable and rugged hardware
  - Complete solution from one source for guaranteed compatibility



# Secure Remote Connectivity with SCALANCE M



## Features / Functions

High data rate (100 Mbps download, 50 Mbps upload) and antenna diversity

Extended temperature range (-20°C to +60°C)

Supported security mechanisms: IPsec, OpenVPN, firewall

Integrated managed 4-port switch

Redundant power supply

Support of country-specific standards UMTS / LTE (incl. US)

Supported in SINEMA Remote Connect

## Benefits

- ▶ Transmission of high data rates over robust wireless connection
- ▶ Use in environments with increased climatic fluctuations
- ▶ Increased network security through the use of common standards
- ▶ Up to 4 IP addresses for various subnets can be configured
- ▶ Reliable operation, even if one power supply should fail
- ▶ Widespread global use
- ▶ Convenient and secured maintenance of widely distributed machines and installations via remote access

# Secure Remote Connectivity with SCALANCE S

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## Industrial security appliance SCALANCE S



**SC632-2C**

**SC636-2C**

**S615**

**SC642-2C**

**SC646-2C**



# SCALANCE S - Industrial security appliances

## “End-to-end engineering” in TIA- Portal

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### Task

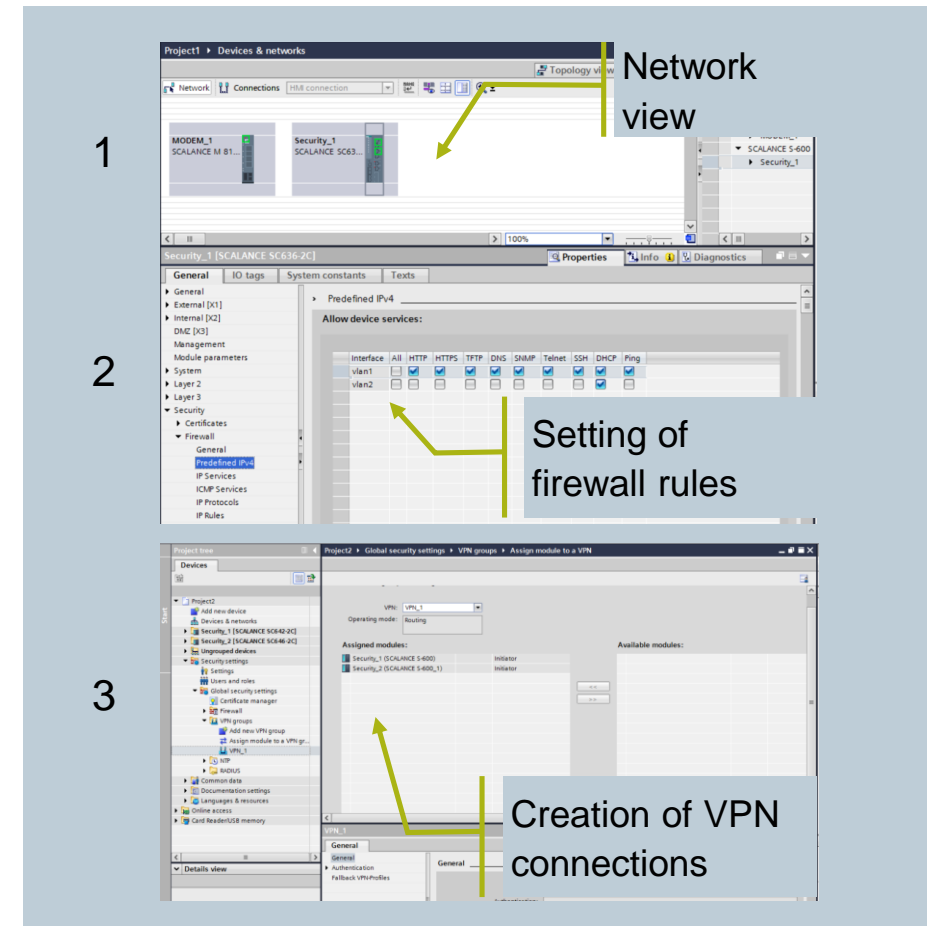
The security components employed in the network are to be configurable via standard engineering methods as well as from a central location.

### Solution

The industrial security appliance SCALANCE S supports common standard methods such as WBM and SNMP, and can also be centrally engineered via the TIA Portal<sup>1)</sup>.

### Benefit

- Standard methods such as WBM, SNMP, MIB are supported
- End-to-end engineering with the TIA Portal<sup>1)</sup>
- Integration into network management systems such as SINEMA Server and SINEC NMS<sup>2)</sup>



<sup>1)</sup> TIA Portal V15 or higher

<sup>2)</sup> Planned start of delivery in 9/2018

# Secure Remote Connectivity – RTU's based on SIMATIC S7 with DNP3



Performance of modular RTUs

**Modular RTU based on  
SIMATIC S7-400**



For large applications with high demands on the performance..

**Modular RTU based on  
SIMATIC S7-300 / S7-1500**



For medium-sized applications with flexible configuration..

**Modular RTU based on Distributed  
Controller SIMATIC ET 200SP**



For small and medium-sized applications with flexible configuration..

**Modular RTU based on  
SIMATIC S7-1200**



For small applications with autonomous power supply.

# Secure Remote Connectivity - Battery powered compact RTU (RTU3000C)

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## Security mechanisms

- OpenVPN tunnel
- Encrypted e-mail connection



## Web Server for configuration and diagnostics



## Remote reading and setting of I/Os



## Data logging on memory card



## Wake-up through SMS or phone call



## High degree of protection with IP68 external enclosure



## Localization and time synchronization via GPS (only with RTU3031C)



## Remote communication

- via cellular radio 2G/3G)
- Through external routers (only RTU3010C)



## Communication

- SMS or e-mail
- Event- or time-controlled
- Telecontrol protocols: TeleControl Basic, DNP3, IEC 60870-5-104, SINAUT ST7
- FTP-Client
- MODBUS RTU/TCP
- HART



## Time Synchronization via

- NTP
- Telecontrol protocol
- Cellular network



## Expanded temperature range -40 to +70 °C (conformal coating)



# Secure Remote Monitoring / Control via DNP3

## Easy VPN Configuration via SINEMA Remote Connect



### Task

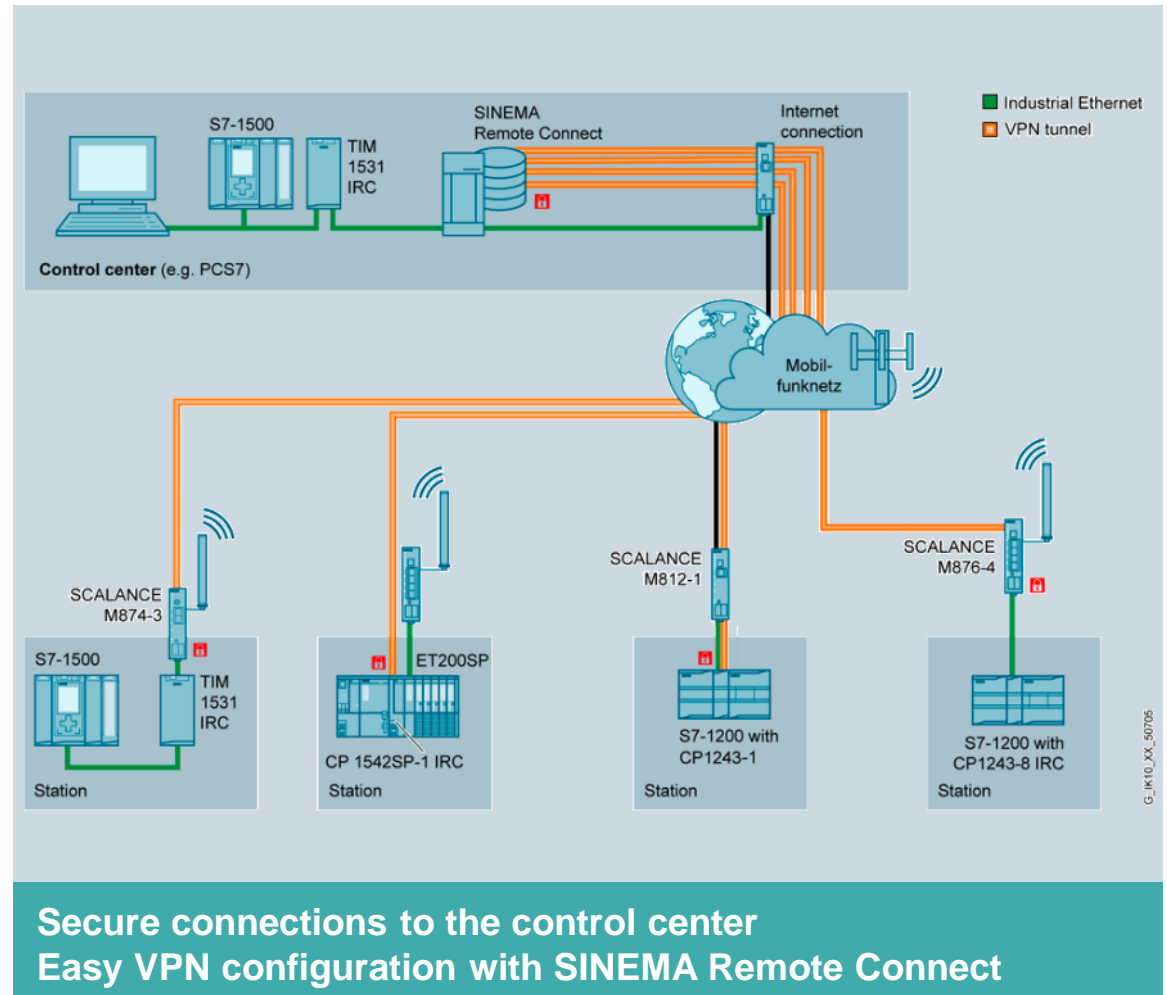
All remote stations of a telecontrol system are to be connected to the control center via public networks using encrypted connections. All VPN connections should be configured from a central location.

### Solution

The SINEMA Remote Connect Server is installed on a PC at the control center. This is where the devices and users, as well as the encrypted tunnel connections (VPN) are managed.

### Benefit

SINEMA Remote Connect makes secure connections to remote stations (RTUs) particularly easy. The CP 1542SP-1 IRC supports SINEMA Remote Connect with autoconfiguration, enabling encrypted connections to be established directly to the RTU.





# Thank you for your attention!



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