COMBIVIS CONNECT FUNCTIONALITY

The rapid and secure remote maintenance platform ensures optimum service conditions in a modern automation system. Via safe end-to-end connections, the centrally managed devices are quickly available without local presence - at any time and anywhere in the world. Furthermore, regular data recording ensures transparent depiction of machine data and allows the best possible analysis and continuous improvement process.

INNOVATIVE SOFTWARE FOR OPEN REMOTE MAINTENANCE TECHNOLOGY

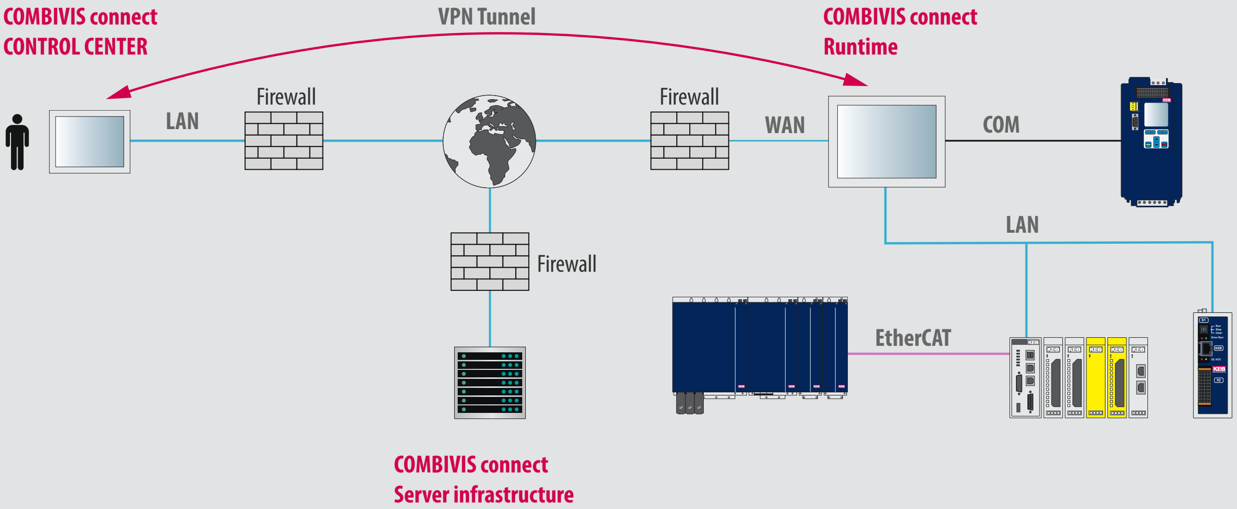
CONNECT Is the basis for professional remote maintenance.
This symbol is placed by the available hardware.

REMOTE MAINTENANCE SOFTWARE WITH A FUTURE

COMBIVIS connect is the future-oriented remote maintenance solution from KEB for the Win32 and Win CE operating systems. It allows automation of machines and plant to be monitored and controlled remotely.

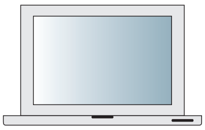
HIGHLIGHTS

- Remote management of KEB device series on which COMBIVIS connect is installed
- Programming, fault search and update of projects working on remote devices in the same subnetwork
- Creates a VPN connection between an operator PC and the remote device by activation of the subnetwork access
- Activates safety processes with end-to-end sessions without intermediary
- Redundant and distributed server architecture guarantees reliability and transmission stability



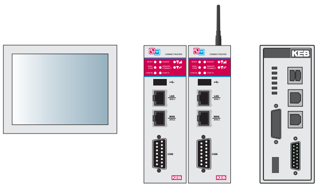
COMPONENT SPECIFICATION

COMBIVIS CONNECT CONTROL CENTER



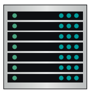
This tool is designed to carry out remote maintenance as simply as possible without great expense, to access domains, manage users and their rights, and register devices. The COMBIVIS connect Control Center is simply installed on the corresponding PCs of the colleagues concerned.

COMBIVIS CONNECT RUNTIME



Runtime contains the installed and executing components on the remote C6 devices. This is what monitors and controls the automatic process and makes the end-to-end VPN connection possible.

COMBIVIS CONNECT SERVER INFRASTRUCTURE



Communication between the Control Center and Runtime is reliably created and managed by the redundant server infrastructure. The latest safety standards guarantee maximum data protection.

COMBIVIS CONNECT DOMAIN

COMBIVIS connect Domain virtually reproduces the customer account in order to be able to use all services and own infrastructures of the KEB remote maintenance solution.

COMBIVIS CONNECT SERVER INFRASTRUCTURE

A redundantly structured, worldwide distributed server infrastructure guarantees access to remote devices at all times. The system is built so strongly that there are no limits in relation to number of users and devices for customers within their own domain.

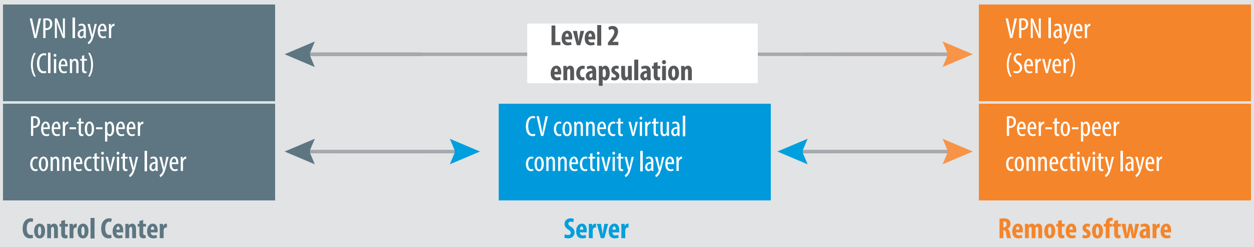
CLOUD-BASED ACCESS

KEB stores COMBIVIS connect Domain in structured fashion in a cloud. This architecture at the same time ensures maximum data security and continuity of service. Colleagues can start the Control Center independently of their current location, and access remote machines. The cloud does not store any project data but with background execution programs deals rather with the registration and management of devices, users, user groups and authorisation profiles.

SAFELY PROTECTED VPN

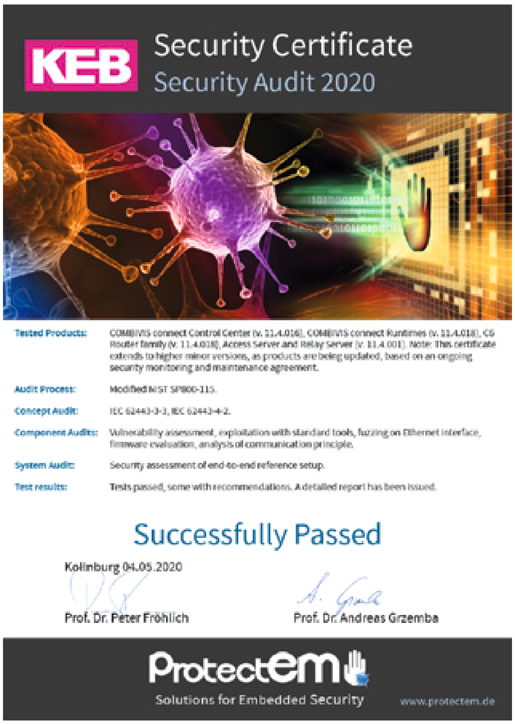
COMBIVIS connect works at the level of the data link layer. This technology brings firm benefits in comparison with VPN-based network layers.

- Because after logging in, the Control Center PC becomes a true member of the remote host network, it is also assigned an IP address from the same physical IP address range.
- For remote operation, users can use broadcast-based protocols.
- Device access requires no additional gateway configuration.


VPN layer (Client)
Peer-to-peer connectivity layer
Control Center
Level 2 encapsulation
CV connect virtual connectivity layer
Server
VPN layer (Server)
Peer-to-peer connectivity layer
Remote software

CERTIFIED SECURITY

With COMBIVIS connect, data protection and data security come first. To underline this, the COMBIVIS connect Access Servers, the C6 Routers, the Control Center, as well as all Runtimes as of version 8 have been certified according to the international standard IEC 62443- for Industrial Communication Networks and IT Security for Networks and Systems. This allows among other things the configuration of a secure password assignment.



KEB Security Certificate
Security Audit 2020

Tested Products: COMBIVIS connect Control Center (v. 11.4.016), COMBIVIS connect Runtimes (v. 11.4.018), C6 Router family (v. 11.4.018), Access Server and Relay Server (v. 11.4.001). Note: This certificate extends to higher minor versions, as products are being updated, based on an ongoing security monitoring and maintenance agreement.

Audit Process: Modified NIST SP800-115.

Concept Audit: IEC 62443-3-3, IEC 62443-4-2.

Component Audits: Vulnerability assessment, exploitation with standard tools, fuzzing on Ethernet interface, firmware evaluation, analysis of communication principle.

System Audit: Security assessment of end-to-end reference setup.

Test results: Tests passed, some with recommendations. A detailed report has been issued.

Successfully Passed

Kollnburg 04.05.2020

Prof. Dr. Peter Fröhlich

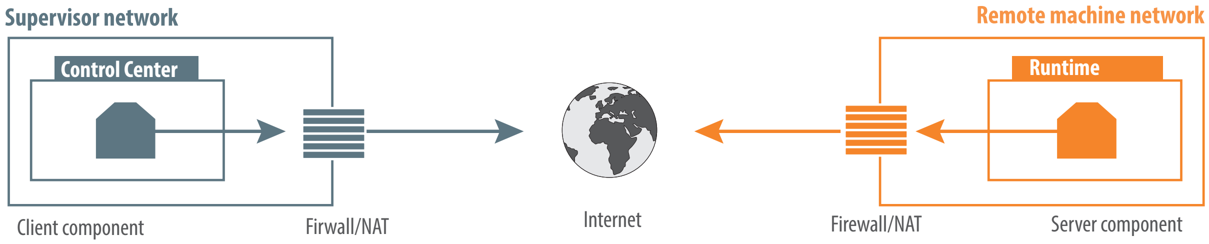
A. Grzemba

Prof. Dr. Andreas Grzemba

ProtectEM
Solutions for Embedded Security
www.protectem.de

COMPATIBILITY WITH EXISTING FIREWALLS

COMBIVIS connect Control Center and COMBIVIS connect Runtime connections are configured as outgoing connections which are acknowledged as secure and therefore acceptable according to firewall guidelines.



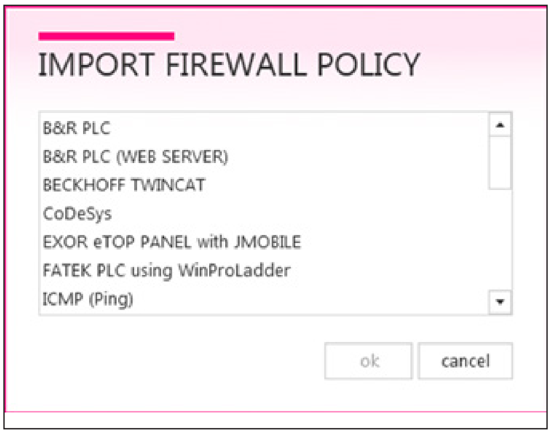
HIGHLIGHTS

- Network and firewall of the end user need not be configured
- COMBIVIS connect automatically uses released TCP and UDP protocols and can use HTTP, HTTPS or user-defined ports
- Compatibility with existing IT security guidelines is guaranteed

COMBIVIS CONNECT

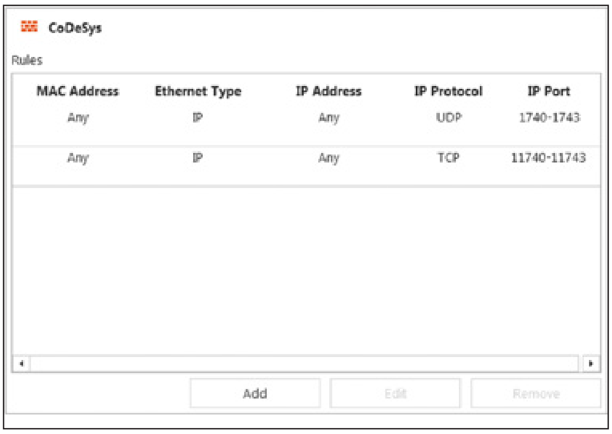
INTEGRATED COMBIVIS CONNECT FIREWALL

The firewall integrated in COMBIVIS connect controls the communication packets which are sent by the VPN. It is possible to filter Ethernet data packets depending on communication protocols and destination addresses. The filter rules can be assigned to individual users or user groups, and the server infrastructure provides a library of ready-made guidelines. This leads to greater safety and bandwidth control, and increased flexibility in the field of access rights.



IMPORT FIREWALL POLICY

- B&R PLC
- B&R PLC (WEB SERVER)
- BECKHOFF TWINCAT
- CoDeSys
- EXOR eTOP PANEL with JMOBILE
- FATEK PLC using WinProLadder
- ICMP (Ping)



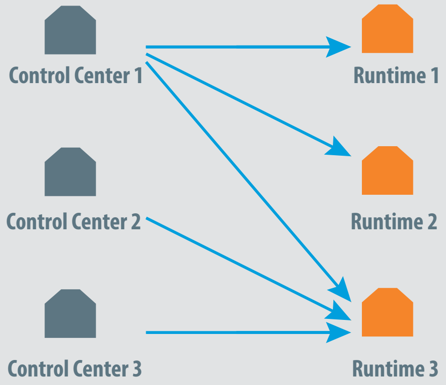
CoDeSys

Rules

MAC Address	Ethernet Type	IP Address	IP Protocol	IP Port
Any	IP	Any	UDP	1740-1743
Any	IP	Any	TCP	11740-11743

MULTICLIENT

COMBIVIS connect Runtime allows simultaneous access to a remote system with several connections.



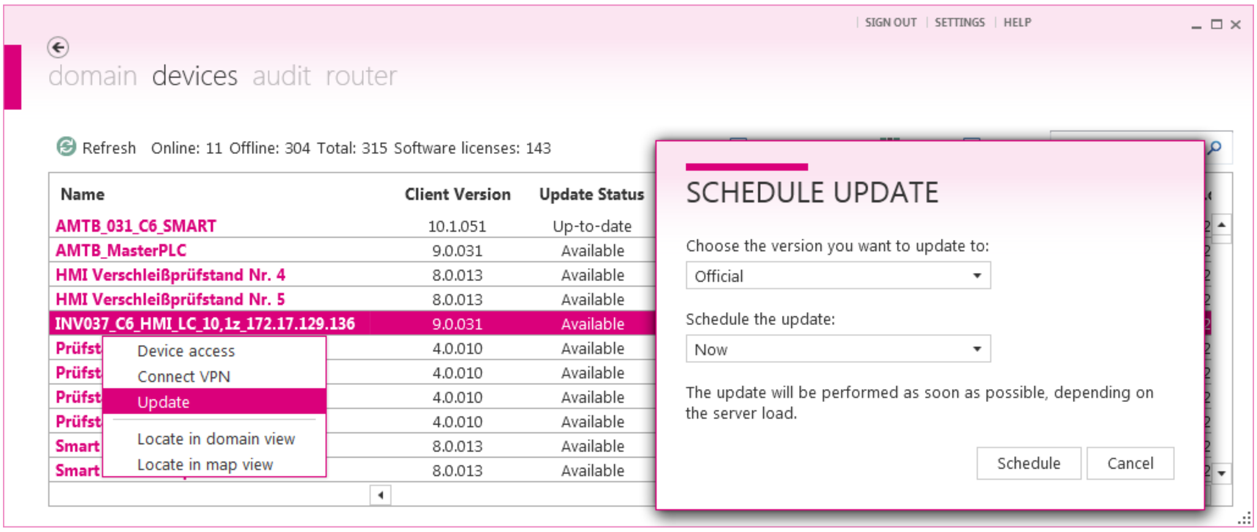
HIGHLIGHTS

- The Control Center can activate interactive sessions with different devices and just one VPN connection via a remote device
- The overall advantage: because more users can work simultaneously on a remote maintenance project, productivity is increased

ALWAYS UP TO DATE

The new update function makes it possible to easily update the runtime of the devices by remote maintenance. This saves a time-consuming and expensive service call. Existing device groups can benefit directly from updated security features.

The system administrator has full control over all software updates. Device, update type and time can be planned individually. Thus, already at work time relevant update can be pre-activated. The update itself can be scheduled for instance during a production break at the weekend.



Online: 11 Offline: 304 Total: 315 Software licenses: 143

Name	Client Version	Update Status
AMTB_031_C6_SMART	10.1.051	Up-to-date
AMTB_MasterPLC	9.0.031	Available
HMI Verschleißprüfstand Nr. 4	8.0.013	Available
HMI Verschleißprüfstand Nr. 5	8.0.013	Available
INV037_C6_HMI_LC_10,1z_172.17.129.136	9.0.031	Available
Prüfst	4.0.010	Available
Prüfst	4.0.010	Available
Prüfst	4.0.010	Available
Prüfst	4.0.010	Available
Smart	8.0.013	Available
Smart	8.0.013	Available

SCHEDULE UPDATE

Choose the version you want to update to: Official

Schedule the update: Now

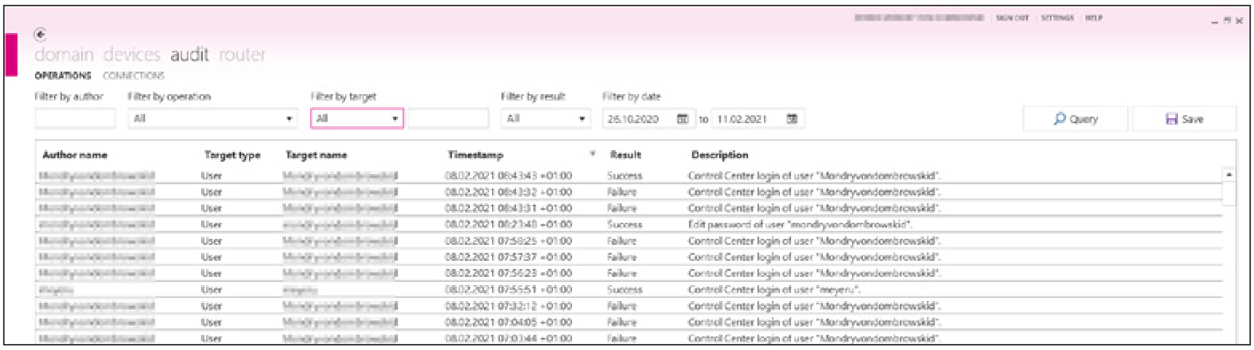
The update will be performed as soon as possible, depending on the server load.

ACCESS ACTIVITY STATISTICS

COMBIVIS connect records and saves all remote access activities at the respective domain.

Network administrators have a full overview of who has worked for how long on a project. The resulting record of time spent can be used for example for later invoicing of an after-sales service.

The accurate combination of orders performed, specifying operator, remote PC and connection time, gives a transparent proof of activity for the end customer.



Filter by author:
Filter by operation: All
Filter by target: All
Filter by result: All
Filter by date: 26.10.2020 to 11.02.2021

Author name	Target type	Target name	Timestamp	Result	Description
[redacted]	User	[redacted]	08.02.2021 08:43:43 +01:00	Success	Control Center login of user "Mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 08:43:32 +01:00	Failure	Control Center login of user "Mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 08:43:31 +01:00	Failure	Control Center login of user "Mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 08:23:48 +01:00	Success	Edit password of user "mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 07:58:25 +01:00	Failure	Control Center login of user "Mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 07:57:37 +01:00	Failure	Control Center login of user "Mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 07:56:23 +01:00	Failure	Control Center login of user "Mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 07:55:51 +01:00	Success	Control Center login of user "meyeru".
[redacted]	User	[redacted]	08.02.2021 07:32:12 +01:00	Failure	Control Center login of user "Mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 07:04:05 +01:00	Failure	Control Center login of user "Mondryvondombrowskid".
[redacted]	User	[redacted]	08.02.2021 07:03:44 +01:00	Failure	Control Center login of user "Mondryvondombrowskid".

COMBIVIS CONNECT

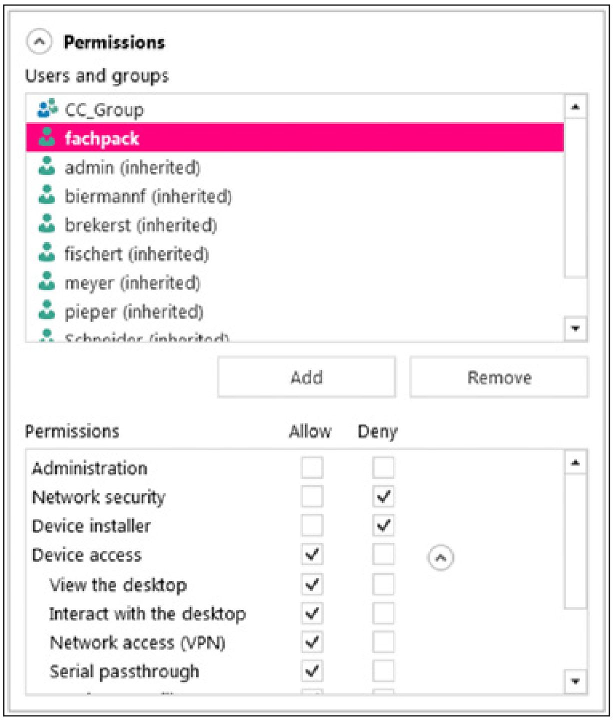
MANAGEMENT OF ACCESS RIGHTS

With COMBIVIS connect, an unlimited number of users, user groups and devices can be defined each with different access rules. Authorisations can be configured flexibly from folder level to the individual device.

- Directory and user management by administrator
- Device installer for inclusion of new devices in the domain
- Network security for configuration of own firewall rules
- Remote access as a basis for remote sessions

The benefits:

- Users can produce and manage their own organisation structure
- Flexible and controlled possibility of reaching all customers world-wide
- Only authorised personnel have secure and structured access to remote devices



Permissions

Users and groups

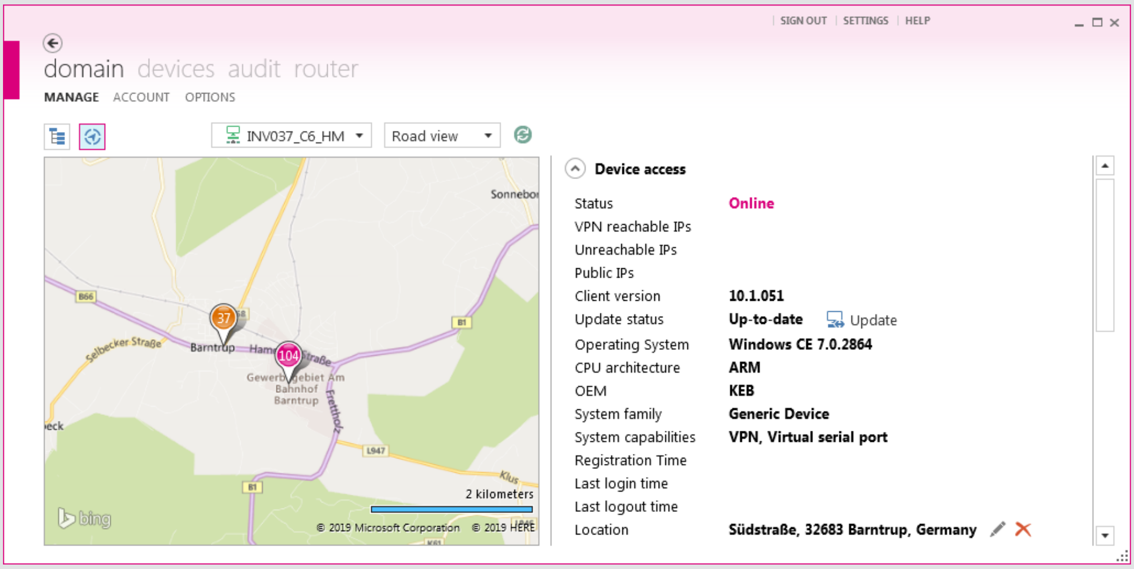
- CC_Group
- fachpack
- admin (inherited)
- biermannf (inherited)
- brekerst (inherited)
- fischert (inherited)
- meyer (inherited)
- pieper (inherited)
- Schneider (inherited)

Permissions	Allow	Deny
Administration	□	□
Network security	□	☑
Device installer	□	☑
Device access	☑	□
View the desktop	☑	□
Interact with the desktop	☑	□
Network access (VPN)	☑	□
Serial passthrough	☑	□

GEO LOCATION

All devices integrated in the domain are displayed in a geographical map. These devices are located via the public IP address. If multiple devices share the same public IP address, they are displayed together in a pushpin. A number in it indicates how many devices are located at this location.

If the positioning via the public IP is not precise enough, this function enables manual position entry via address or geographical coordinates. When using a SIM card, the location accuracy depends on the provider.



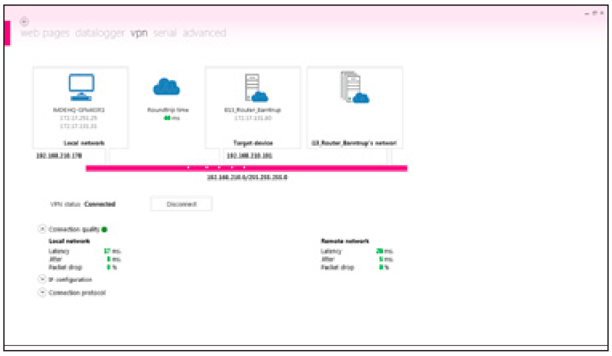
Device access

Status	Online
VPN reachable IPs	
Unreachable IPs	
Public IPs	
Client version	10.1.051
Update status	Up-to-date Update
Operating System	Windows CE 7.0.2864
CPU architecture	ARM
OEM	KEB
System family	Generic Device
System capabilities	VPN, Virtual serial port
Registration Time	
Last login time	
Last logout time	
Location	Südstraße, 32683 Barntrup, Germany

SECURE VPN CONNECTION

COMBIVIS connect automatically installs a VPN adapter on the Control Center PC. The virtual Ethernet adapter works as a VPN client and receives an IP address from the existing VPN network from the remote device (VPN server). There is a direct end-to-end connection between the communication partners.

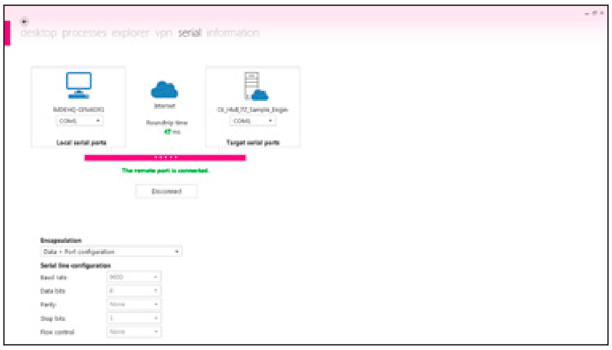
- The connection is securely protected from external access and manipulations, to all IP-based devices in the VPN network
- Quick search for KEB devices via COMBIVIS 6



VIRTUAL SERIAL CONNECTION

COMBIVIS connect automatically installs a virtual serial adapter on the Control Center PC. The virtual serial port of the Control Center PC can be mapped to a physically present port of the remote device if COMBIVIS connect Runtime is installed. The serial connection mode provides the opportunity of serial communication via RS232, RS422, RS485 or MPI.

- Even remote serial devices can be monitored, diagnosed and adapted for new tasks
- You can also search for individual KEB devices in a targeted fashion in COMBIVIS 6 in serial communication



The remote port is connected.

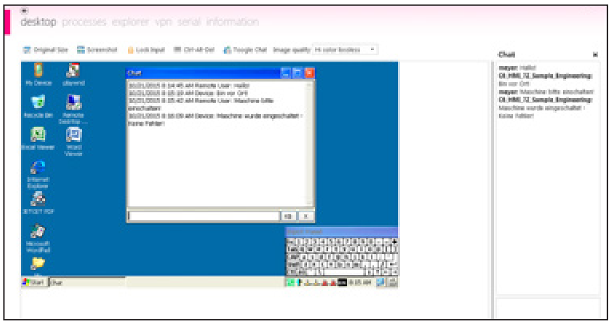
Encapsulation: Data + Port configuration

Serial line configuration

Baud rate	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

CHAT BETWEEN LOCAL AND REMOTE PC

To allow the exchange of important information quickly in a project, KEB has provided a chat function in the remote maintenance solution. This allows direct communication without separate telephone conferences, because the technician at the CONTROL Center is directly connected via the remote maintenance network to the remote engineer on site in on-line chat.



Chat

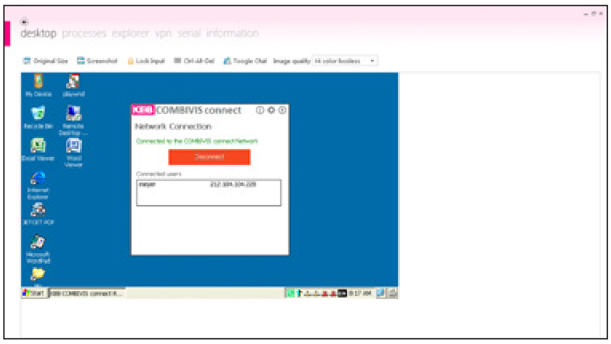
10/21/2015 8:14:45 AM Remote User: Hallo!
10/21/2015 8:15:10 AM Device: Bin vor Ort
10/21/2015 8:15:42 AM Remote User: Maschine bitte einschalten!
10/21/2015 8:16:09 AM Device: Maschine wurde eingeschaltet - Keine Fehler!

Chat

mayer: Hallo!
CE_HMI_72_Sample_Engineering: Bin vor Ort
mayer: Maschine bitte einschalten!
CE_HMI_72_Sample_Engineering: Maschine wurde eingeschaltet - Keine Fehler!

REMOTE DESKTOP FUNCTION

The Control Center software offers a remote function with which desktops of remote devices can be operated remotely, without additional services or support programs.



Network Connection

Connected to the COMBIVIS connect Network

Connected users

mayer

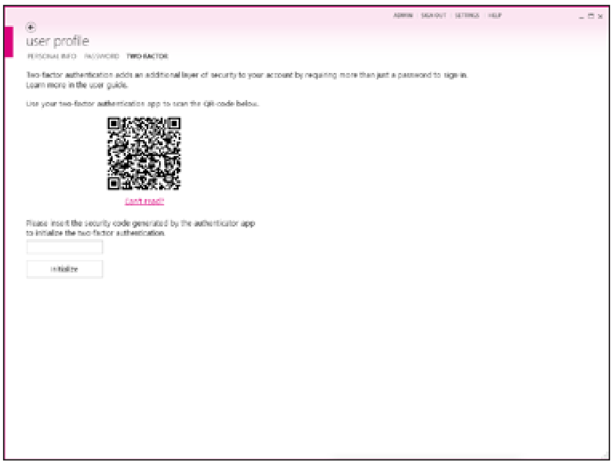
TWO FACTOR AUTHENTICATION

The safety procedure of the two-factor authentication requires two different characters for identification to increase the secure of the use account. After activating the feature, the access is only possible using the combination of the following two different factors.

- Username and password
- App-verification

Requirements:

- Valid e-mail address
- Smartphone / Tablet with camera and a connection to the
- internet to read the QR-code
- App (e.g. Authy, Google Authenticator Dou
- or Microsoft Authenticator)



Two-factor authentication adds an additional layer of security to your account by requiring more than just a password to sign in.
Learn more in the user guide.

Use your two-factor authentication app to scan the QR-code below.

Can't read?

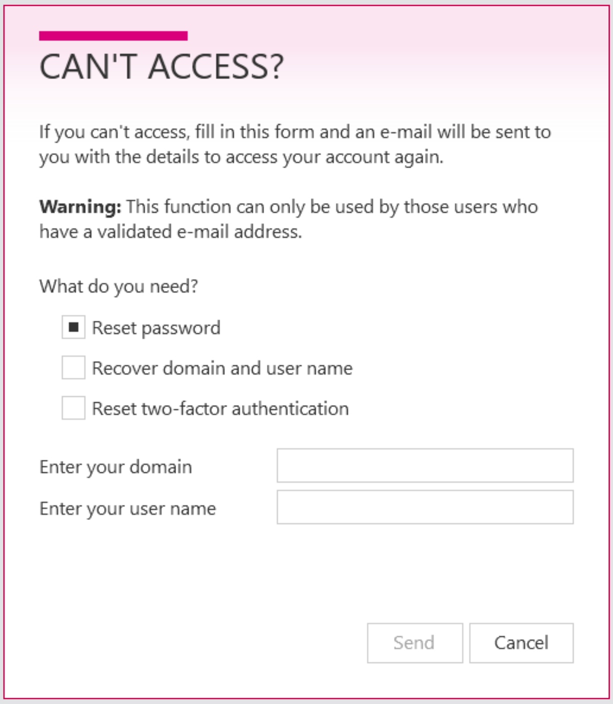
Please insert the security code generated by the authenticator app to initialize the two-factor authentication.

CAN´T ACCESS?

If the user forgot the access data, the data can be reset by using the “Can´t access” function. Only the valid e-mail address is required.

The following options are available here:

- Reset password
  - o The user receive an e-mail with a link to reset the password.



CAN'T ACCESS?

If you can't access, fill in this form and an e-mail will be sent to you with the details to access your account again.

Warning: This function can only be used by those users who have a validated e-mail address.

What do you need?

■ Reset password

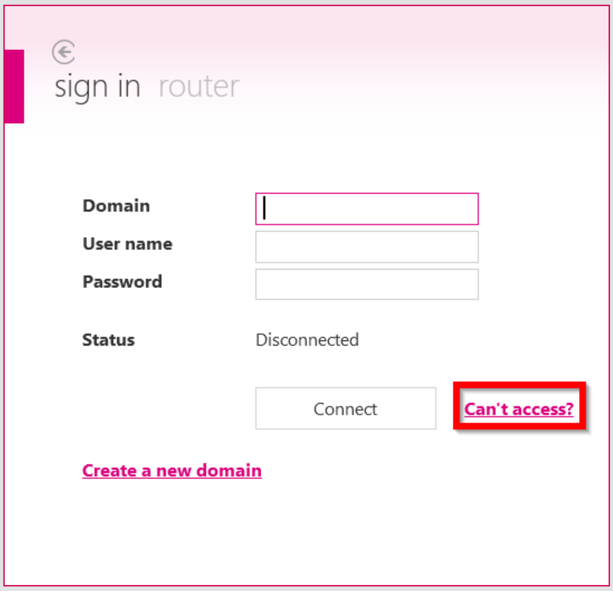
□ Recover domain and user name

□ Reset two-factor authentication

Enter your domain

Enter your user name

- Recover domain and user name
  - o The user receives his access data via e-mail.
- Reset two-factor authentification
  - o Reboot of two-factor authentication.



Domain

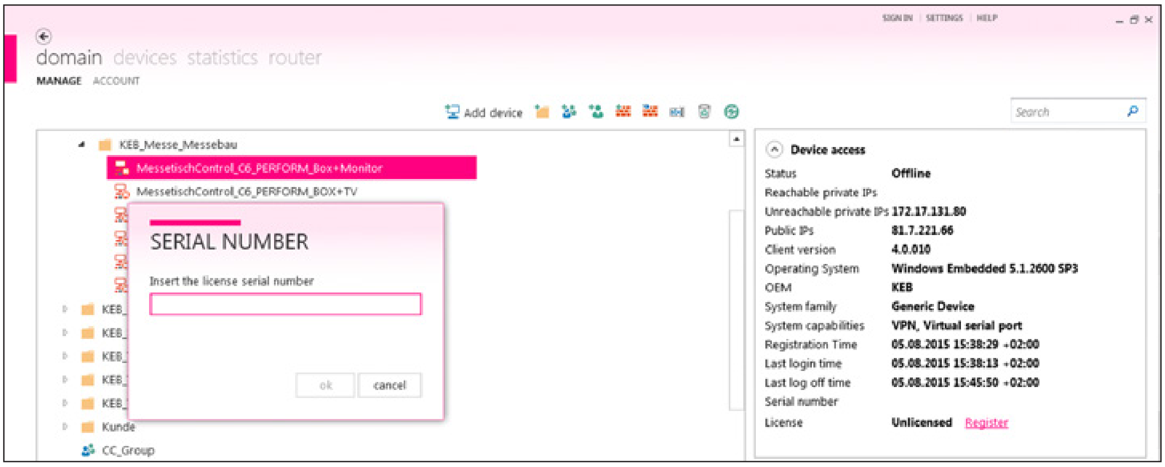
User name

Password

Status Disconnected

DEVICE MANAGEMENT

C6 IPCs and C6 HMIs with COMBIVIS connect Runtime can be included in a domain using their ID and a password, and registered with their serial number. This excludes registration under further domains, which safely prevents access outside the domain. The unique access rules extend to device level.



SERIAL NUMBER

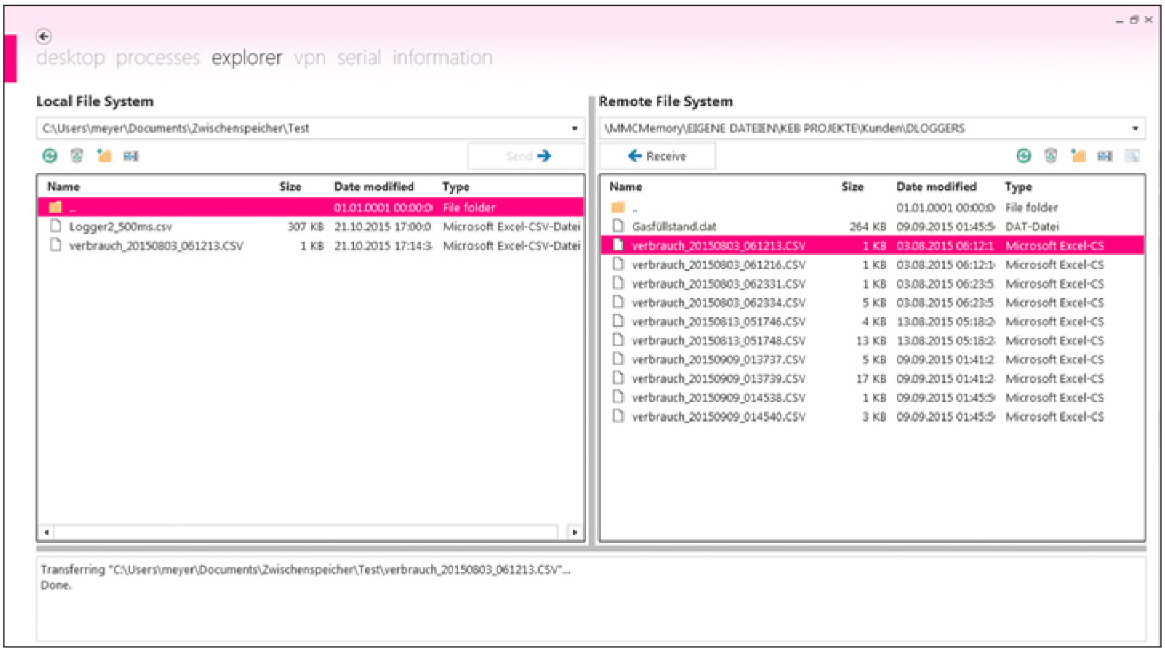
Insert the license serial number

Device access

Status	Offline
Reachable private IPs	
Unreachable private IPs	172.17.131.80
Public IPs	81.7.221.66
Client version	4.0.010
Operating System	Windows Embedded 5.1.2600 SP3
OEM	KEB
System family	Generic Device
System capabilities	VPN, Virtual serial port
Registration Time	05.08.2015 15:38:29 +02:00
Last login time	05.08.2015 15:38:13 +02:00
Last log off time	05.08.2015 15:45:50 +02:00
Serial number	
License	Unlicensed Register

FILE EXCHANGE WITH REMOTE DEVICES

Thanks to the Remote Explorer Control Center function, a complete tool is available for downloading and uploading of files. This brings the benefit that access to the directories of the VPN partner need no longer be granted separately. Additional applications such as FTP servers are also no longer required.



Local File System

C:\Users\meyer\Documents\Zwischenspeicher\Test

Name	Size	Date modified	Type
..		01.01.0001 00:00:0	File folder
Logger2_500ms.csv	307 KB	21.10.2015 17:00:0	Microsoft Excel-CSV-Datei
verbrauch_20150803_061213.CSV	1 KB	21.10.2015 17:14:3	Microsoft Excel-CSV-Datei

Remote File System

\MMCMemory\EIGENE DATEIEN\KEB PROJEKTE\Kunden\DLOGGERS

Name	Size	Date modified	Type
..		01.01.0001 00:00:0	File folder
Gasfüllstand.dat	264 KB	09.09.2015 01:45:5	DAT-Datei
verbrauch_20150803_061213.CSV	1 KB	03.08.2015 06:12:1	Microsoft Excel-CS
verbrauch_20150803_061216.CSV	1 KB	03.08.2015 06:12:1	Microsoft Excel-CS
verbrauch_20150803_062331.CSV	1 KB	03.08.2015 06:23:5	Microsoft Excel-CS
verbrauch_20150803_062334.CSV	5 KB	03.08.2015 06:23:5	Microsoft Excel-CS
verbrauch_20150813_051746.CSV	4 KB	13.08.2015 05:18:2	Microsoft Excel-CS
verbrauch_20150813_051748.CSV	13 KB	13.08.2015 05:18:2	Microsoft Excel-CS
verbrauch_20150909_013737.CSV	5 KB	09.09.2015 01:41:2	Microsoft Excel-CS
verbrauch_20150909_013739.CSV	17 KB	09.09.2015 01:41:2	Microsoft Excel-CS
verbrauch_20150909_014538.CSV	1 KB	09.09.2015 01:45:5	Microsoft Excel-CS
verbrauch_20150909_014540.CSV	3 KB	09.09.2015 01:45:5	Microsoft Excel-CS

```
Transferring "C:\Users\meyer\Documents\Zwischenspeicher\Test\verbrauch_20150803_061213.CSV"...
Done.
```

COMBIVIS CONNECT

FUNCTIONS

TARGETED REMOTE MAINTENANCE ACTIVITIES

Monitoring and start-up of remote devices

Access, fault search and programming of controls and automation devices

Preventative and predictive maintenance

Updates and changes of software applications on remote controllers

Access to Ethernet and serial subnetworks

SUPERIOR REMOTE MAINTENANCE FEATURES

Available for Win 32 and Win CE platform

No additional hardware required

Uses the existing Internet connection

Remote PCs need no further services (VNC, FTP server, etc.)

Simple and user-friendly interface, simple setup

SSL/TLS protocol, encryption and certificates

Safe and fast thanks to end-to-end VPN

Automatic connection to first free relay server with shortest waiting time

Multi-client Runtime

INNOVATIVE FUNCTION PROPERTIES

Remote desktop with multi monitor support

Remote explorer

Chat, screenshot, task manager, statistics

VPN to remote PC

VPN with access to the Ethernet subnetwork of remote devices

Virtual serial interface

Domain creation, hierarchical profiling of users and remote PCs

Automatic connection creation after restart of remote PC

Rights allocation for users and user groups

Assignment of firewall rules at folder and device levels

COMBIVIS CONNECT RUNTIME

Remote desktop (also multiple sessions with Windows Server),

file and task management, chat, screenshot

VPN to remote system

VPN with access to Ethernet of remote system

VPN with access to subnetwork of remote system serial interface

Integrated firewall

API for interface with in-house software applications

Permanent log Runtime operations

Multiple connection of different control centres

Creation of domain, structured organisation of users and remote PCs

Support for Internet connection via PROXY for Control Center and Runtime

Operation in local network without licence

Support for control of Runtime with automatic management of termination and restart of Runtime service

HIGHLIGHTS

- Certified security according to IEC 62443
- Direct file exchange between local PC and remote device
- Ethernet and/or serial connection between local PC and remote device via VPN
- Integrated COMBIVIS connect firewall for communication through VPN / full compatibility with existing firewalls
- Multi-client functionality supports several simultaneous connections of different observers
- Management of access rights for an unlimited number of users and devices
- Recording of access activities in statistics