94222E-02
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FLEXIT CS 1000

E **User Guide**
OPC Operation

ART.NR.:55576

Contents

1 About this Document

1.1 Foreword

Purpose

The purpose of this document is to provide users with a quick and simple means to familiarize themselves with the configuration of RemoteOPC and use of the RCC card. The communication card ACX52.22 is used by the ACX32 and ACX34 controller.

1.2 Notes on Use

Target audience

This document is intended for developers who perform commissioning of OPC.

1.3 Symbols and Abbreviations

Passages introduced by this symbol indicate a warning to help prevent incorrect operation.

Passages introduced by this symbol indicate that the text must be read with special attention.

Paragraphs with this symbol provide tips.

Abbreviations

Abbreviation	Description
RCC	Rainbow Communication Card
OPC	OLE for Process Control
WINS	Windows Internet Naming Service
DHCP	Dynamic Host Configuration Protocol
TCP/IP	Transmission Control Protocol / Internet Protocol
MAC address	Media Access Control; globally unique, 32 bit "serial number" of the network card
VVS14.0	Valid Version Set
Dial-In	Connection initiated by the RCC card (Incoming call at the PC)
Dial-Out	Connection initiated by the client PC

2 RCC Communication card

2.1 What is RCC?

General

The RCC card is a communication card that can be used in conjunction with both SAPHIR primary controllers (ACX32 and ACX34) and contains among other things:
- Web server and FTP server
- TCP/IP
- RAS, Modem connection

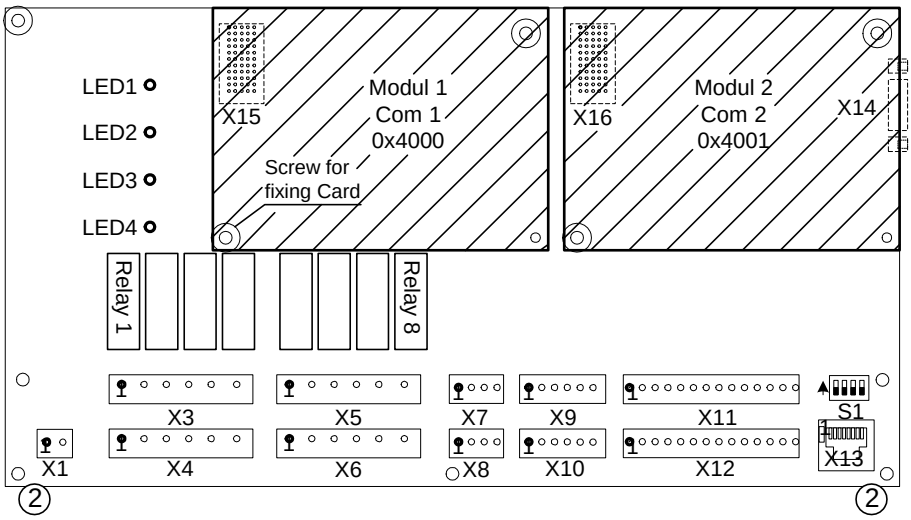
The explanations provided in this document are generally based on the basic configuration of the RCC card.
The term basic configuration refers to the as-delivered state of the ACX52.22 RCC card.

All information refers to WINDOWS CE image RCCV2_VVS14.0 or higher and are also recommended for OPC communication via RemoteOPC.

The VVS14.0 RCC card requires the OS3.0 operating system or higher on the SAPHIR side (see SAPHIR documentation).

2.2 Mounting

Follow the instructions below for mounting the RCC card on the Saphir controller.



Instruction

1. Power off.
2. Dismounting the two forward outside screws on cover with a screw-driver type Torx 10 or a flat chisel.
   Note! Connect yourself to earth to avoid static electricity that could seriously damage the circuit card.
3. Mount metal fixing supports.
4. For ACX32, place the card with belonging cover plate in the “Com 1” slot.
   For ACX34, place the card with belonging cover plate in the “Com 2” slot.
5. Check that the card is correct connected.
6. Fix card with the screws that are in the kit.
7. Remount the Cover of the controller.
8. Power on.

2.3 Communication

2.3.1 IP address assignment

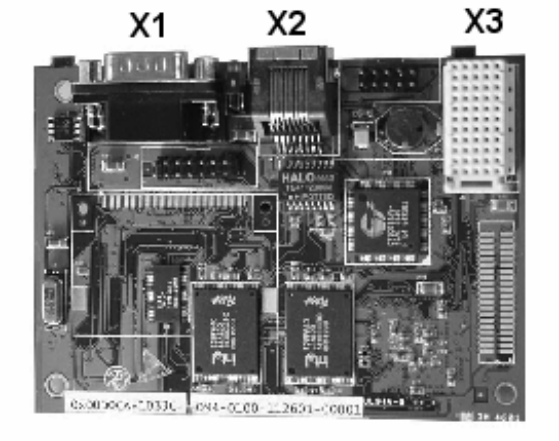
IP address assignment is either dynamic via DHCP server, or it can be manually preselected via HMI.
The present IP address can also be read via HMI.

Network

RCC must be properly logged on to the network, or the RCC card cannot be accessed via TCP/IP. Additionally, all network services, such as the integrated Web server, will not be accessible.

2.3.2 Connection of TCP/IP

Follow the instructions below to set up the TCP/IP connection.



Instruction

1. Commissioning unit with all settings before starting to install TCP/IP.
2. Attach the network cable to connector X2.
3. Restart by switch off the power.
4. Log in with password (1000 or 2000).
   Navigate to menu “Systemparameter – Communication – RCC-Configuration”
   Here can the IP-address be read out or changed.
5. If a DHCP-server exists the given IP-address could be read.
6. If an own IP-address should be entered, then enter menu “Change IP”
   Change “DHCP” to “Fixed”. Then write the new address. To confirm new address change “apply” to “Yes”.
7. **Restart by switch off the power or perform a software restart.**

2.3.3 Name resolution (WINS)

RCC can, however, log on to a WINS server if there is one present on the network.
If logon is successful, the corresponding WINS name can be used to access the device from that time onwards.
You can easily determine the WINS name from the sticker on the card:

MAC address

- The top number on the sticker is the RCC's MAC address. It always has the form 00 A0 03 FF xxxx, where xxxx is a sequential number.
- The WINS name is made up of the prefix SBT_RCC_V2_ and xxxx (i.e. the last four digits of the MAC address). This name can be change via the integrated Webserver, and are also visible in the HMI.

Example:

The MAC Address on the sticker is 00 A0 03 FF 0AC1. Therefore, the resultant WINS name is SBT_RCC_V2_0AC1.

The WINS server should be able to resolve a '`ping`' on the name, and it should display the present IP address.

2.3.4 Connecting to the Web/FTP server via Internet Explorer

Web server

To establish a successful connection to the Web server, use the WINS address or the IP address.

Example: *”http://SBT_RCC_V2_0AC1/” or ”http://146.253.69.197/”*

FTP server

To establish a successful connection to the FTP server, use the same address as for the web server, but replacing "**http://**" with "**ftp://ADMIN@**".

Example: *”ftp://ADMIN@SBT_RCC_V2_0AC1/”*

Password FTP Server

Log in with:
User name: ADMIN
Password: SBTAdmin!

The same password can also be used for RAS connection to the RCC

The Web server is among other things used to set up the modem communication, this is described later in this document.

2.4 Update the RCC communication card

Update RCC image

The RCC card can easily be updated with a new version if necessary, ex. if it is an already installed card with lower VVS. The new image is updated via the TCP/IP network by starting an exe file on a PC connected to the network and just type in the IP address or WINS name to the Saphir. After a restart the new image is active, but with factory settings, so all settings include the IP address must be set again.

2.5 RCC integrated OPC server

RCC OPC Server

An OPC server runs on the RCC (WinCE operating system). This server is not DCOMM-enabled. A special software component (DeviceCom) has to be installed on a PC so that an OPC client can access the server functionality. This server has been used as the Saphir OPC server until now. This OPC server is still available and may be used as well but the recommendation is to use the new Remote OPC instead.
For more information about the integrated OPC server there is a separate manual available.

The RemoteOPC server functionality described in the following is completely different from this existing RCC OPC server function. The RemoteOPC server receives the process data it needs directly via the Saphir controller's Object Handler.

3 Remote OPC

3.1 What is Remote OPC?

General

The RemoteOPC application is an OPC DA server as well as a management function, for RCC dial-up connections or/and TCP/IP connections, that runs on the WinXP or Win2000 operating system in the client PC. The number of dial-up connections that can be established simultaneously is limited by the hardware used (number of COM ports with modems). The number of RCC's that can be managed is theoretically unlimited. The Remote OPC is running as a service on the client PC. For each RCC it creates cache files for fast access and offline browse.

See the PD972-25-009_EN document for more details.

3.1.1 TCP/IP connection

TCP/IP

The Remote OPC server can also have access to the RCC via a direct TCP/IP connection. The direct TCP/IP connection is always online.
Either the IP address or the RCC name can be used.

3.1.2 Dial-in/out connection

Dial-In function

An RAS dial-in connection is parameterized on the PC for each COM modem interface. If a connection is established by an incoming call, the management part of the RemoteOPC server compares the RCC's name (e.g. SBT_RCC_V2_ABCD) with the names of the permitted RCC’s. If the name is known, the server checks whether the objects in the Saphir controller are known. If so, the OPC DA server sets the objects online. If not, the Saphir controller's Object Handler is interrogated, and the controller is added to the RemoteOPC server's namespace. The controller's OPC tags are then available. The tags are valid as long as the connection to the RCC remains established. The initiator of an active dial-in connection must break the connection again.

Dial-Out function

A connection must be established to a given Saphir controller if a given event occurs when there is no online connection. The RCC name is included in the corresponding OPC tag name (event trigger). A dial-up modem connection must be parameterized for each RCC name on the system. The appropriate connection is activated when the event occurs.
Since multiple connection names can be parameterized on the "Modem-X" hardware resource, the resource may already be occupied by another outgoing connection or by an incoming call from another RCC. In this case, the event must be postponed. When the defined time (Time_Con_Retry) expires, a new attempt is made to connect to the respective Saphir controller.
The number of repeat connect attempts is set using the "Con_Retry" parameter.
These parameters are passed in the "RemOPC_Env.csv" environment file.

3.1.3 Online / Offline handling

As long as there is an active connection to one or more of the RCC’s to be managed, the data of the respective controller(s) is marked as valid. Process data changes are updated in the server's process image via the COV handling mechanism, and the clients that are logged on are updated.

As soon as there is no longer an active connection, the tags are marked as offline.

3.1.4 Environment file

The environment file "RemOPC_Env.csv" contains all of the required program parameters.
These are the connection type (TCP/IP or Modem), timeout period for active dial-up connections, the connection repeat timeout, the number of dial-up attempts, and all of the RCC's to be processed by the server.

The file is stored in the same directory as the RemoteOPC application. It is read when the application starts. Only incoming calls from the known RCC's are accepted by the RemoteOPC server for OPC tag administration.

The set up of this file is described later in this document.

3.2 Install Remote OPC

The Remote OPC server application together with the OPC Core Components and the drivers to communicate with the Saphir has to be installed in the client PC.
Follow the step-by-step instructions below.

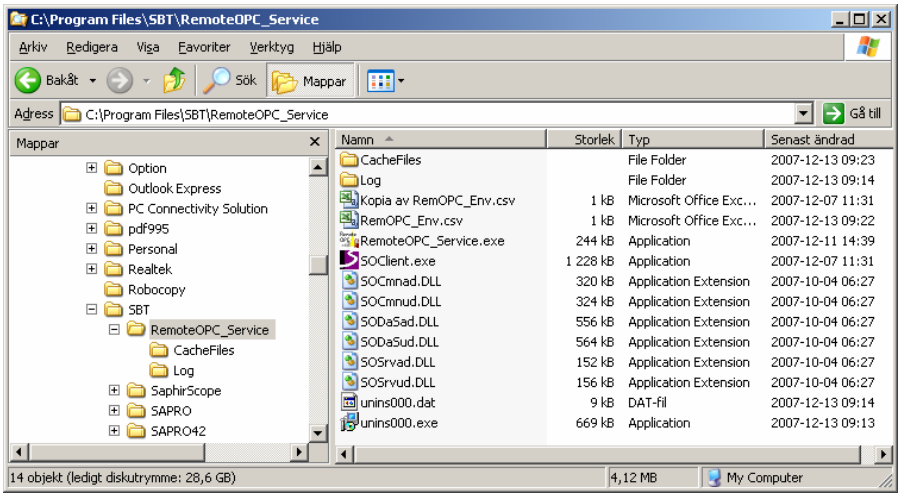
Instruction

1. Install the Scope version 6.10 or higher.
   Follow the instructions on the screen.

2. Install the OPC Core Components version 3.00 or higher.
   Follow the instructions on the screen.

3. Install the Remote OPC service version 6.40 or higher.
   Follow the instructions on the screen.

4. Check the installation. The following files and folder should be installed in the default installation path.



4 Configuration

4.1 Edit the Environment file

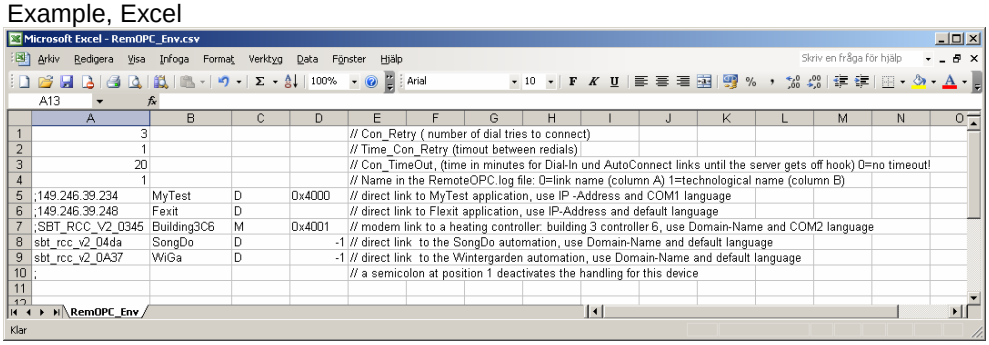
Each RCC that will be connected to the Remote OPC server must be set up in the environment file. Follow the step-by-step instructions below.

Instruction

1. Open the "RemOPC_Env.csv" environment file with Excel or Notepad.
   The file is stored in the same directory as the RemoteOPC application, default, C:\Program Files\SBT\RemoteOPC_Service. This file contains also examples, so it could be good to copy this file before edit, to keep the examples.

Example:

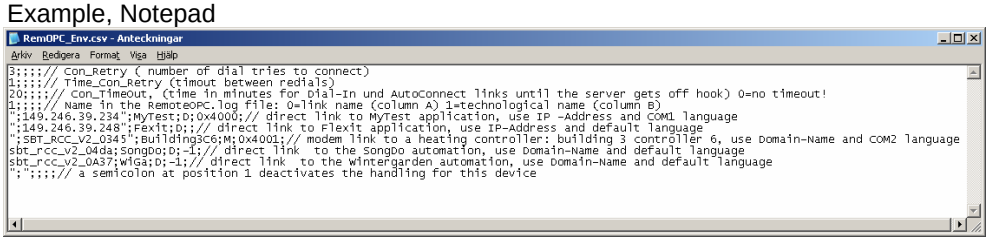
Example, Excel



	A	B	C	D	E
1	3				// Con_Retry (number of dial tries to connect)
2	1				// Time_Con_Retry (timout between redials)
3	20				// Con_TimeOut, (time in minutes for Dial-In und AutoConnect links until the server gets off hook) 0=no timeout!
4	1				// Name in the RemoteOPC.log file: 0=link name (column A) 1=technological name (column B)
5	;149.246.39.234	MyTest	D	0x4000	// direct link to MyTest application, use IP -Address and COM1 language
6	;149.246.39.248	Fexit	D		// direct link to Flexit application, use IP-Address and default language
7	;SBT_RCC_V2_0345	Building3C6	M	0x4001	// modem link to a heating controller: building 3 controller 6, use Domain-Name and COM2 language
8	sbt_rcc_v2_04da	SongDo	D	-1	// direct link to the SongDo automation, use Domain-Name and default language
9	sbt_rcc_v2_0A37	WiGa	D	-1	// direct link to the Wintergarden automation, use Domain-Name and default language
10	;				// a semicolon at position 1 deactivates the handling for this device
11					

Example:

Example, Notepad



Example:

Example of a "RemOPC_Env.csv" file:

```
3;;;;                                   // Con_Retry
1;;;;                                   // Time_Con_Retry
20;;;;                                  // Con_TimeOut
1;;;;                                   // Trace name: 0=link name, 1=technol. name
192.168.2.111;Test1;D;0x4000;           // Testdevice 1 direct link, language COM1
SBT_RCC_V2_0A37;Test2;D;0x4001;         // Testdevice 2 direct link, language COM2
SBT_RCC_V2_0A37;Building3C6;D;-1;       // Contr. 6 in building 3, direct link, def lang
SBT_RCC_V2_0234;Building3C7;M;-1;       // Contr. 7 in building 3, modem link, def lang
“;SBT_RCC_V2_0F45”;C1;M;0x4000;         // Contr. 1, modem link, Deactivated
```

Empty line if edit in Notepad

2. Set up line 1 to 4 that is global parameters for modem connection and trace. Those parameters are valid for all modem connections. Only the first position in the line is used.

   Line 1 - Con_Retry - Number of dial-out attempts
   Line 2 - Time_Con_Retry - Time between dial-out attempts
   Line 3 - Con_TimeOut - Timeout for active connections
   Line 4 - Trace name - Name in trace file, 0=link name, 1= technological name

3. Starting from line 5, all the handled controller are described. Set up an own line for each RCC with all parameters described below, with a semicolon for separation. The file must end with an empty line.

   - The first parameter for direct links can be either the IP-address or the RCC-Name. For modem links only the RCC-Name can be used. (Address resolution).

   - The second parameter is a freely defined technological name. This name is used as the root name in the OPC item tree-view e.g. (Building3C7.ACX32.SystemClock.Hour).

     Depending on parameter on line 4 either the link name e.g. the RCC-name or the technological name will be used in the trace file.

     If left empty the technological name will be the same as the link name/address.

   - The third parameter defines the link type.
     D - direct link (TCP/IP)
     M - modem link.

   - The last parameter defines the OPC tag names and hierarchy. For the cache file creation a language selection (-1, 0x4000 or 0x4001) can be used for direct links. Is this parameter missing, the default language -1 will be used. The application implementation language is the default language.
     The language selection via a modem link is done with the virtual tag “SetLanguageID“. This tag will only be available if no cache files for the particular link are available.
     -1 - Default language (Application language)
     0x4000 - COM1 language, Recommended to use for all RCC
     0x4001 - COM2 language, Not recommended

4. A comment can be added to each of line after a TAB control character.
   A description line ends with the CR control character.

   A semicolon at the first entry in a line will disable the handling of this controller.
   If edit with NotePad there must also be a “ first and last for the first parameter e.g. NotePad “;SBT_RCC_V2_0F45”; Excel ;SBT_RCC_V2_0F45;

If more RCC’s are added later in the environment file, then Remote OPC service must be stopped and started again, due to that this file is only read when Remote OPC service starts.

4.2 Set up TCP/IP connection

TCP/IP connection

Set up TCP/IP connection for RCC's defined with direct link in the environment file. If no direct links are defined, then continue to the next section.

Remote OPC use the TCP/UDP port 4242 for communication and this port must be open in a firewall.

Instruction

1. Follow the instructions in chapter 2.2 and 2.3 to mount the RCC card and setup the TCP/IP address if it is not already done.

2. Ping the RCC card with the WINS or the IP address to test the communication.

Example: *(WinStart->Run->Open "CMD") C:\>ping sbt_rcc_v2_0AC1*

No extra configuration is normally needed for TCP/IP connection.

4.3 Set up Modem connection

Modem connection

A modem connection, RAS, has to be set up for each RCC's defined with modem link in the environment file. If no modem links are defined, then continue to the next section.

A TCP/IP connection to the RCC card is needed during the configuration, but can however be just a crossover cable between the RCC and a PC.

Follow all step-by-step instructions below. This guide is for WinXP.

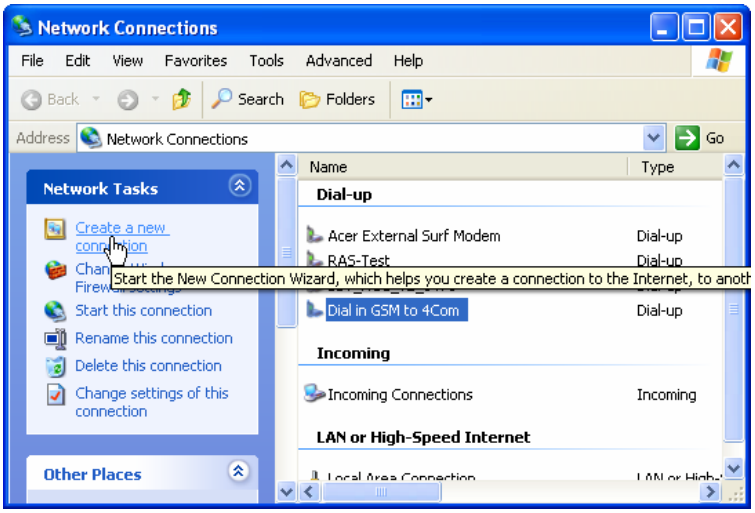
4.3.1 Dial-In connection to the Client PC

An "incoming connection" must be parameterized for each connection to be made from the outside. No assignment to RCC's is made.

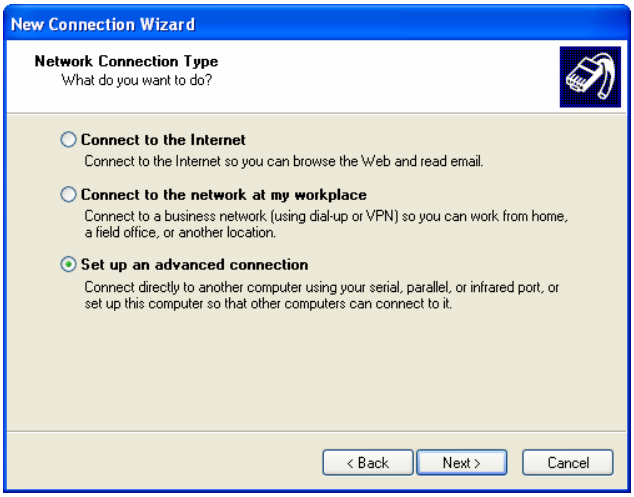
Instruction

1. Select Start -> Settings -> Network and Dialup connections.

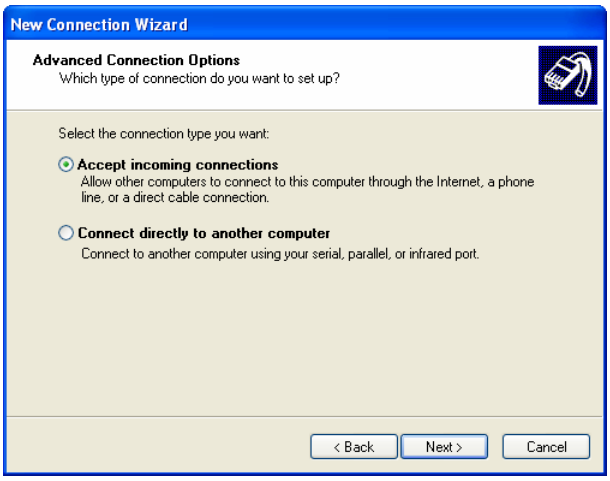
   Choose "Create a new connection" and use the network connection wizard.



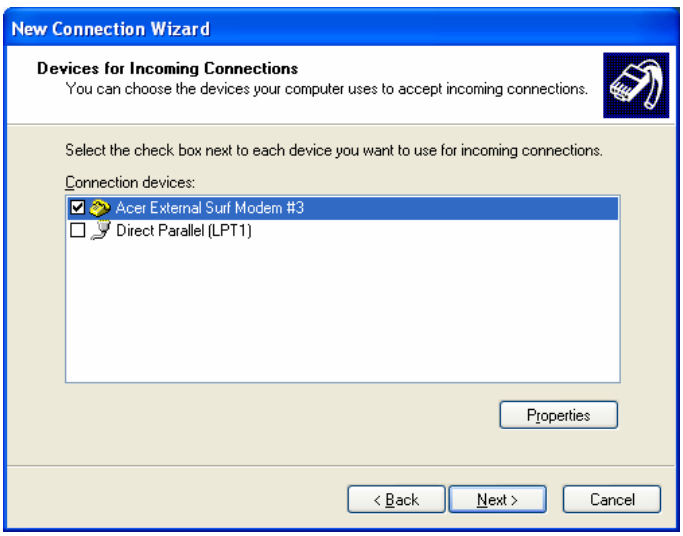
2. Choose "Set up an advanced connection“.



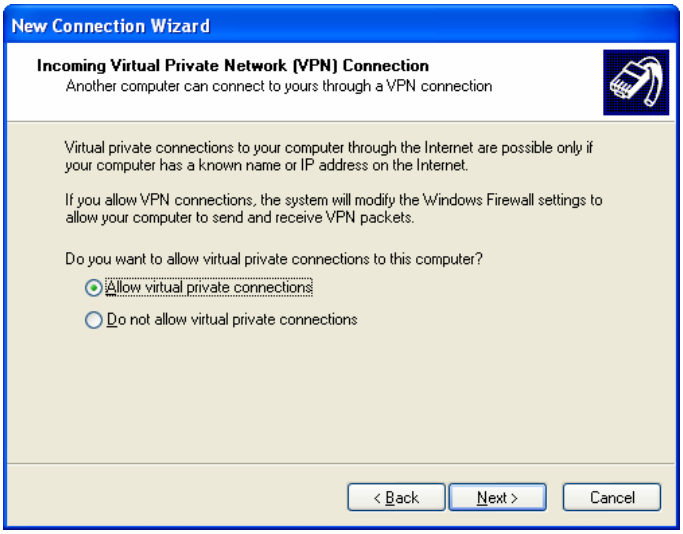
3. Choose “Accept incoming connections”.



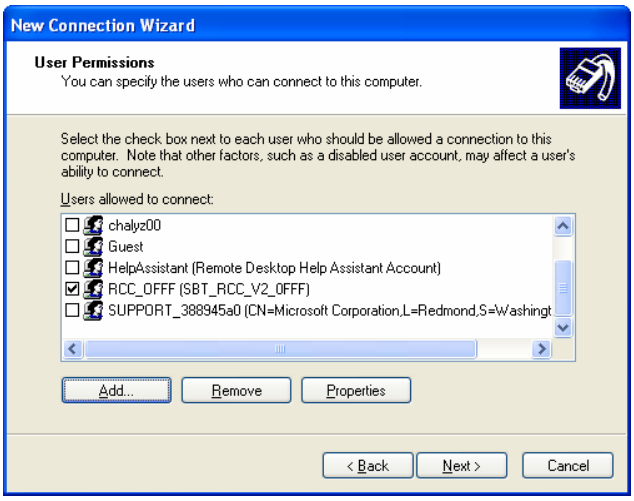
4. Select modem.



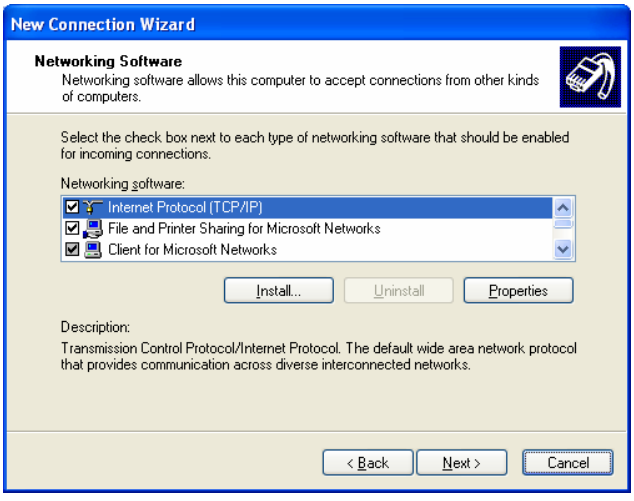
5. Choose “Allow virtual private connection”.



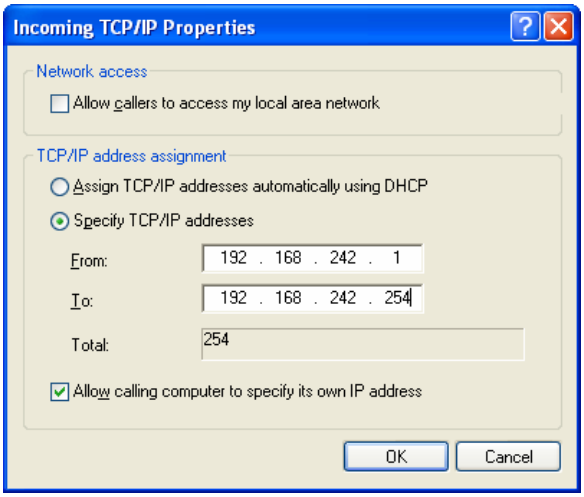
6. Add a User with Name and Password.



7. Change the Properties of TCP/IP.



8. Choose your IP range off the RCC Cards.



9. Enter the connection name and finish.

⚠ In the RemoteOPC application, the RAS thread waits for connections via Port 42058 (0xA44A). This port must be open in a firewall.

4.3.2 Dial-Out Client PC

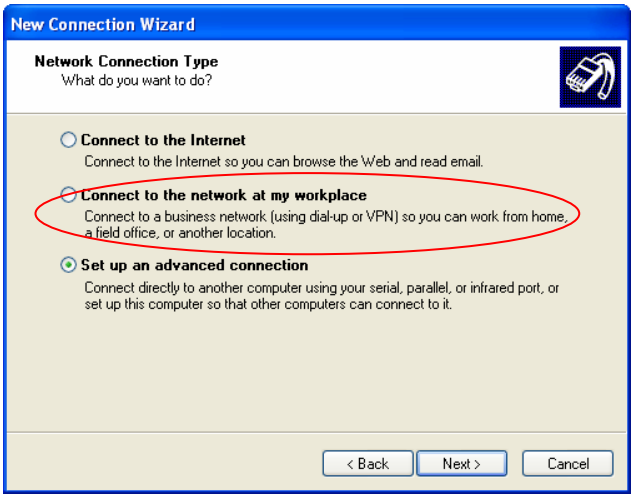
An RAS connection must be parameterized for each RCC to be managed by the RemoteOPC server. The connection must have the same name as the RCC to be contacted (e.g. SBT_RCC_V2_0FDA). This connection name establishes the relationship between an event and a Saphir controller that is to be notified in the field.

Instruction

1. Select Start -> Settings -> Network and Dialup connections.

   Choose "Create a new connection" and use the network connection wizard.

2. Choose "Connect to the work network“ (VPN).



3. Select modem.

4. Enter phone number.

5. Choose “For all users”

6. Define the “Connection Name”, has to be the same name as the RCC to be contacted and also defined in the environment file e.g. "SBT_RCC_V2_0FDA", and finish.

The default Username and Password can be used, but it is possible to choose an own one if needed.

Default Username: ADMIN
Default Password: SBTAdmin!

If an event is triggered that causes a change in a tag, the correct connection is established via the tag name part at the top level (RCC name).

4.3.3 RCC card

The RCC card must be configured for RAS connection. This must be made via TCP/IP.

Instruction

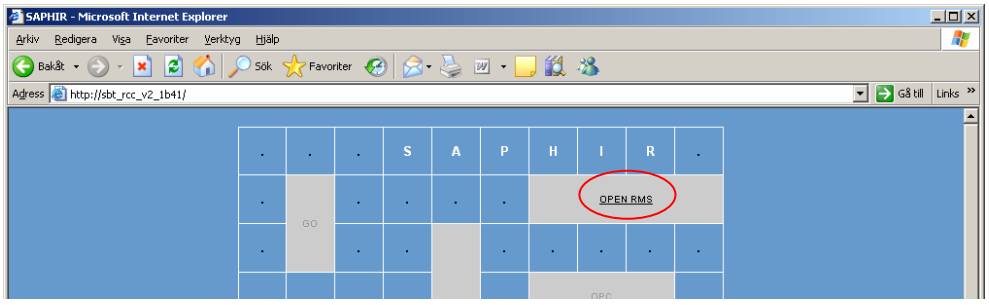
1. Follow the instructions in chapter 2.2 and 2.3 to mount the RCC card and setup the TCP/IP address if it is not already done.
   For a direct RCC to PC connection a fixed TCP/IP address must be set up.

Example:	*PC*	*RCC*
IP	*192.168.0.10*	*192.168.0.20*
SN	*255.255.255.0*	*255.255.255.0*
GW	*192.168.0.1*	*192.168.0.1*

2. Ping the RCC card with the WINS or the IP address to test the communication.
   Example: *(WinStart->Run->Open “CMD”) C:\>ping sbt_rcc_v2_0AC1*

3. Connect to the Web server with the WINS/RCC-name or the IP address via Internet Explorer.
   Example: *”http://SBT_RCC_V2_0AC1”*

4. Click on the “Open RMS” link.
   If the link is missing or there is a login page then fill in the *”/rms/rms.html”* in the address field.
   Example: *”http://SBT_RCC_V2_0AC1/rms/rms.html”*



RCC Version

At the top to the right the actual version for the RCC card is shown. The version has to be VVS12SP1 or higher but recommended is VVS14 or higher. The RCC version can also be found in the Registry Manager, key: **HKEY_LOCAL_MACHINE\Ident**

RAS settings

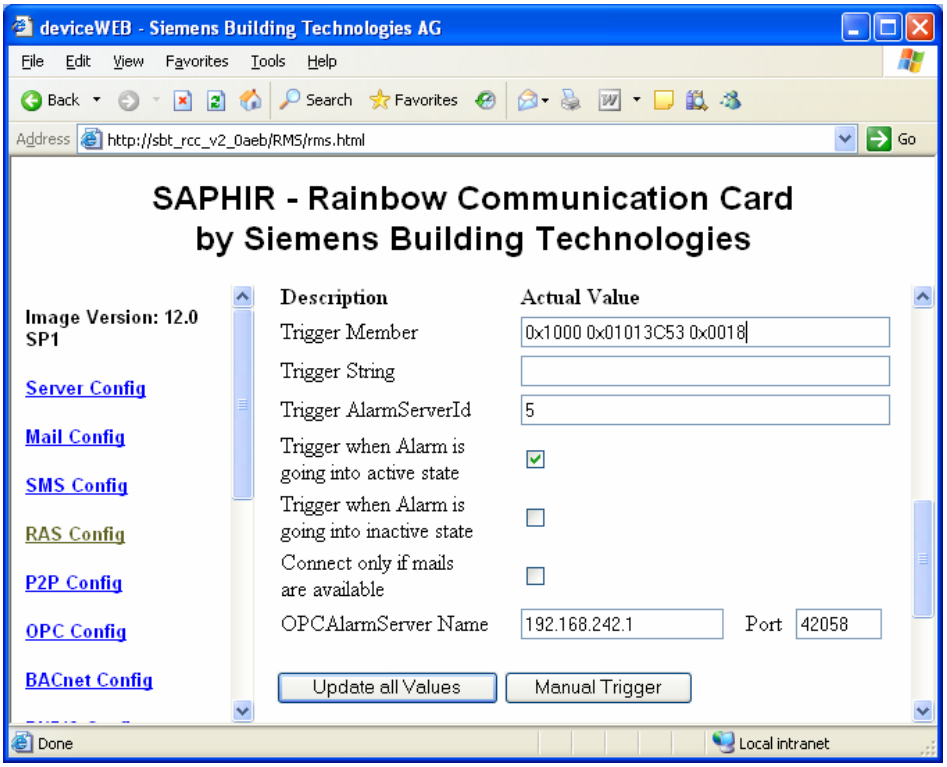
5. Click on the ”RAS config” link and “Create a new connection”.

- Define the “Name of Connection”.
- Define the “Phone Number” to the Client PC.
- Define the “User Name”, has to be the same as defined in the client PC.
- Define the “Password”, has to be the same as defiend in the client PC.

- Press the “Submit” button and then the “Back” button.

⚠ The User Name and Password has to be the same as defined for the incoming connection, in the client PC in the User Permission, described before in this manual.

6. Set up the trigger event and the target Remote OPC server.



- Define the “Trigger Member” for alarms, Ex. Unit’, HiearchyNewFault’
- Set the “Trigger AlarmServerId” to 5.
- Set the tic for “Alarm active state”, and the other tics if needed.
- Define the “OPCAlarmServerName”, Use the IP-number defined in the Client PC for incoming calls.
- Set the “Port” to 42058.

- Press the “Update all Values” button.

Any changes on the RAS Configuration Page needs a reset of the RCC card.

Own User name and Password can be set up at the “Server config” page. The same User name and Password must then also be used for the outgoing connection in the client PC.

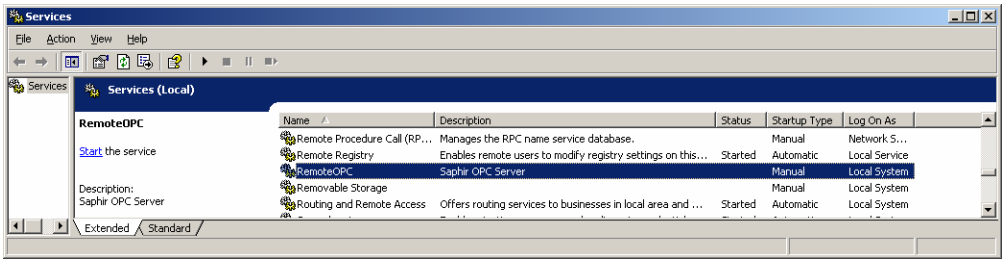
4.4 Set up Remote OPC service

Remote OPC service

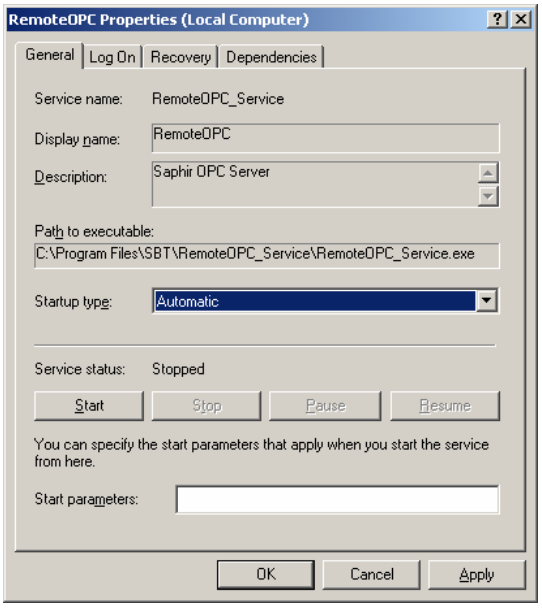
Remote OPC is running as a service and after installation the “Startup type” is set to “Manual”. The service handler is used to manage Remote OPC and change the “Startup type” to “Automatic” or just handle the manual start and stop.

Instruction

1. Select Start -> Settings -> Control Panel -> Administrative Tools -> Services.



2. The service properties can be changed with a right click on the RemoteOPC application.



Start the RemoteOPC server either manually, or set the “Startup type” to “Automatic”, so the application starts with a system boot up sequence.

4.5 Cache files

Cache files

For each RCC Remote OPC creates cache files for fast access and offline browse. After the first installation of the RemoteOPC server, no cache files are available. Cache files are created, for every new RCC in the environment file, at every startup of Remote OPC. Excisting cache files are resistant and are not read in again.
If more RCC’s are added later in the environment file, then Remote OPC service must be stopped and started again, due to that this file is only read when Remote OPC service starts

Three files must be created for every controller and the files is found in the default path “C:\Program Files\SBT\RemoteOPC_Service\CacheFiles”.
They are named either by the IP-Address or the RCC-Name with different extensions.

For the IP 149.246.39.234 the files

149.246.39.234_ObjData.bin
149.246.39.234_TypeDesc.bin
149.246.39.234_TypeInfo.bin
are created,

or for the link SBT_RCC_V2_04DA the files

SBT_RCC_V2_04DA_ObjData.bin
SBT_RCC_V2_04DA_TypeDesc.bin
SBT_RCC_V2_04DA_TypeInfo.bin
are created.

4.5.1 Create cache files for Direct links, TCP/IP

Be sure the controller is connected to the LAN and a ping to the controller is possible.

When the RemoteOPC server is started, the cache files for all direct linked controllers will be created. This may take a few seconds.

4.5.2 Create cache files for Modem links

Start an OPC client (e.g. Softing democlient) and connect to the Remote OPC Server.

For a modem link without cache files, only 5 virtual tags are available.

Please set the tag “ManualConnect” = 1 and your PC will dial out to connect to the selected controller

After the connection is established, the cache files will be created. As soon as all three files are created, the line will ring off.

Repeat it for all modem links without cache files.

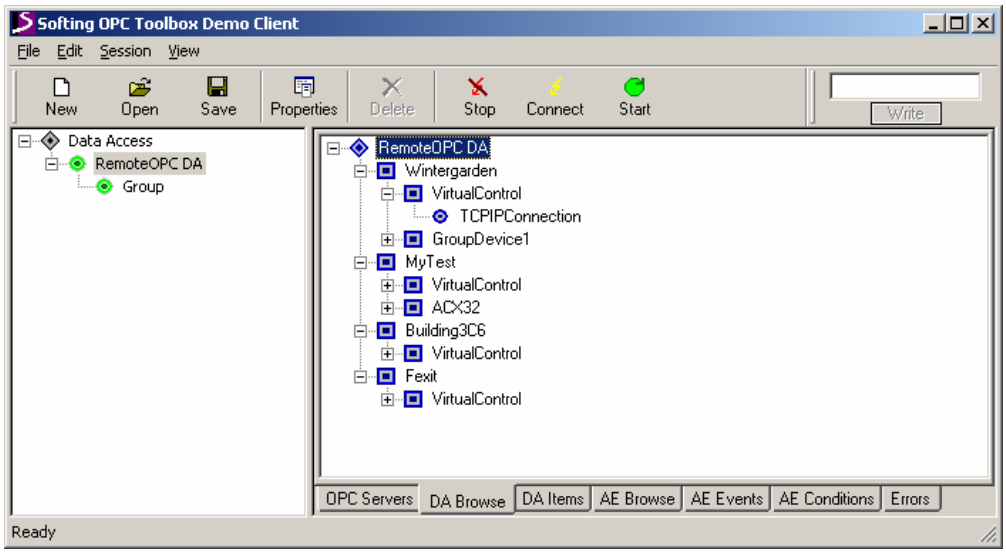
After all modem link cache files are available, you have to restart the RemoteOPC Server ones.

This procedure has to be done just for the very first time to get the cache files, or in case for a certain controller, when a new application has been loaded.
In the second case the old cache files must be removed manually before connecting to the controller with a new application running.

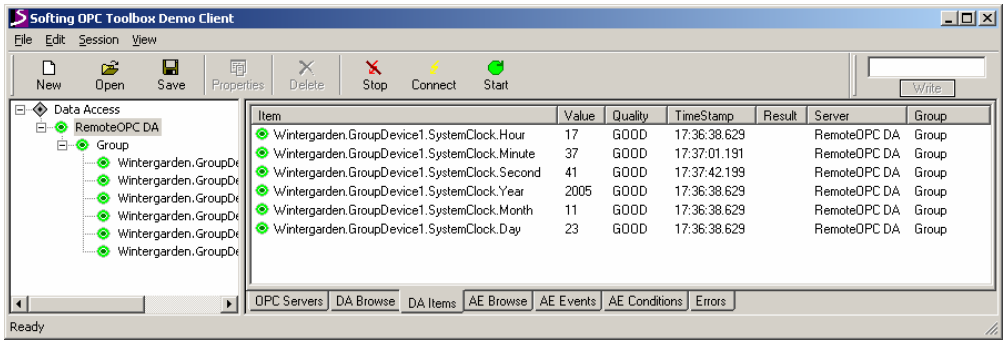
5 Use Remote OPC

5.1 OPC Client

When all the cache files are available it is possible to browse with an OPC-Client the object tree of all the known controller, even they are offline.



After selecting the wanted tags the values are updated as the controller is online.



5.2 Control and status tags for modem connection

Three virtual control variables are added to the object tree of a Saphir controller.

Auto_Connect:
The "Auto_Connect" control variable is a Boolean value. If the variable is set to TRUE, a connection to the Saphir controller is automatically established in case of write access to a tag when there is no online connection to the controller. The connection remains active for the timeout period. The timeout time is re-triggered by each write access.
If a connection cannot be established, the dial-out attempt is repeated after the "Time_Con_Retry" timeout period. The number of repeat connect attempts is limited by the "Con_Retry" parameter.

Manual_Connect:
The "Manual_Connect" control variable is a Boolean value. If the variable is set to TRUE, a connection is established to the Saphir controller. An existing connection is not interrupted, or a connection attempt is not cancelled until the variable changes to FALSE. If a connection cannot be established, the dial-out attempt is repeated after the "Time_Con_Retry" timeout period. The number of repeat connect attempts is not limited by the "Con_Retry" parameter.

Status_Connect:
The "Status_Connect" status variable is a Boolean value. It indicates whether there is an active dial-up connection to the respective controller (TRUE == Online).

5.3 Troubleshooting

General Network

- The RCC card or the Saphir must be restarted after IP and RAS configuration. (hardware or software restart is possible).
- When use of Fixed IP address, change parameter DHCP to Fixed, change IP address, confirm by change “apply” to “Yes” and restart the controller.
- Try to ping the controller if the communication is not working. If the ping fails something is wrong in the network or the IP settings.
- Check that the defined UDP port is open in the firewall.

RCC version

- The version has to be VVS12SP1 or higher for Remote OPC to work.
  The RCC version can be found under “Treeview/Device/Version”.

Remote OPC

- The opcproxy.dll must be registered. Remote OPC are using OPC v3 and some clients don’t have support for v3, then the opcproxy.dll must be change to an older one.
- If Remote OPC don’t create cache file for the last RCC in the environment files it’s probably not a CR after that line, there must be an empty line at the end of the file.
- Direct link RCC’s that are not used (not online) should be deactivated or deleted in the environment file and the cache file should be deleted as well.

Web pages

- If there is another start/front page than the default, it is probably a compact flash memory installed at the RCC card. Remove the memory or type in the direct address to the actual page.

Modem

- GSM modems should NOT be used, due to that the communication speed is to low.

Other

- New Saphir controllers may have a time scheduler for BACnet and that one is not compatible with OPC. Anyhow, the old time scheduler with OPC compabillity is often still available in the controller after a reconfiguration.

6 OPC Object types and members

This chapter explains the Object handler and the members that can be used for each object type. Recommended members to use with OPC are marked, other members should be used with carefulness, especially the “ValueDectection” member.

6.1.1 Setpoint: Real

MemberID	Member Name	Description
0x0000	UserAccess	Specifies operation privilege. The member setpoint (0x0003) can only be changed in "Man".
0x0001	HighLimit	High input limit for member setpoint (0x0003)
0x0002	LowLimit	Low input limit for member setpoint (0x0003)
0x0003	Setpoint	Valid setpoint

6.1.2 Setpoint: Enum

MemberID	Member Name	Description
0x0000	UserAccess	Specifies operation privilege. The member setpoint (0x0002) can only be changed in "Man".
0x0001	HighLimit	High input limit for member setpoint (0x0002)
0x0002	Setpoint	Valid setpoint

6.1.3 Messure (Analog input)

MemberID	Member Name	Description
0x0000	ValueDetection	This parameter can be used to deactivate the detection of parameters 0x1200 and 0x0009. These members are then also writeable.
0x1200	ValueFault	"Active" indicates that this measured value is in an error state
0x0001	HighLimit1Active	Indicates that the value is above the high alarm limit (0x000A).
0x0002	HighLimit2Active	Indicates that the value is above the high warning limit (0x000B).
0x0003	LowLimit2Active	Indicates that the value is below the low warning limit (0x000C).
0x0004	LowLimit1Active	Indicates that the value is below the low alarm limit (0x000D).
0x0005	SlidingLimits	As long as this parameter is active, the limits are read cyclically via the "HIL", "HIWL", "LOWL" and "LOL" inputs. The corresponding members can then not be overwritten with the ObjectHandler.
0x0006	FaultStored	As long as this parameter is active, the fault (0x1200) is stored, i.e. it must be reset with the appropriate message class (0x0007).
0x0007	MessageClass	Fault message class (0x1200)
0x0008	SuppressLimitCheck	This member can be used to suppress limit value monitoring. As long as this parameter is active, out-of-limits conditions do not produce a database entry, and the parameters (0x0001…0x0004) are set to zero.
0x0009	PresentValue	This parameter signalizes the measured value without an error.
0x000A	HighLimit1	High alarm limit
0x000B	HighLimit2	High warning limit
0x000C	LowLimit2	Low warning limit
0x000D	LowLimit1	Low alarm limit
0x000E	InputCorrection	Offset for input value connection. It is added to the physical input value, then signalized at member 0x0009.
0x000F	PT1Filter	Delay time in seconds of the PT1-element for smoothing. As long as the parameter is set to zero, no smoothing occurs.

6.1.4 PosCommand (Analog output)

MemberID	Member Name	Description
0x0000	ValueDetection	This parameter can be used to deactivate the detection of present position 0x000A and fault 0x0001. In this case, member fault is also writeable. The present position 0x000A is set equal to the setpoint position 0x000D.
0x0001	Fault	Indicates the stored fault.
0x0002	RemoteActuating	If inactive, the controller has no access to the hardware. The present position is indicated in each case. The "POSN" output is set to 0.
0x0003	ApplicationControl	Indicates that the step setpoint (0x000B) is specified by the application in automatic mode (0x0003).
0x0004	CTRLLoopLock	Indicates that the control element is not available to the controller.
0x0005	UserAccess	Specifies operation privilege. The member position setpoint (0x000D) can only be changed in "Man". 0=Hand, 1=Auto
0x0006	Forcing	Indicates that override control is active.
0x0007	MessageClass	Fault message class (0x0001)
0x0008	PresentValue	Control element feedback signal
0x0009	HighLimit	The high control limit of the control element can be entered here.
0x000A	LowLimit	Low control limit of the control element
0x000B	Setpoint	Indicates the present position setpoint. Can be changed by the ObjectHandler if 0x0003 = TRUE.
0x000C	Sensitivity	Accuracy of the control element. Only setpoint changes that are greater than this member are passed to the "POSN" output.
0x000D	Output Type	Indicates the control signal type: 0 = analog output, analog feedback signal 1 = digital output, feedback signal calculated using actuating time 2 = digital output, analog feedback signal
0x000E	Digital:OpenTime	The time the valve requires to fully open.
0x000F	Digital:CloseTime	The time the valve requires to fully close.
0x0010	Digital:LongSync	Default value FALSE: If TRUE, the outputs remain active at the end positions. If FALSE, the signal only remains active for 3x the time.

6.1.5 Message (Alarms)

MemberID	Member Name	Description
0x0000	ValueDetection	This parameter can be used to deactivate the detection of parameter 0x0001. This member is then also writeable.
0x0001	CurrentState	"Active" means that this status message is active: State text from member 0x1101
0x0002	StoredState	Indicates the stored state: State text from member 0x1101
0x0003	WorkingContact	"Active" means normally open contact: Otherwise normally closed contact, i.e. a signal at the "DI" input is the good state
0x0004	MessageClass	Fault message class (0x0002)
0x0005	FaultStored	As long as this parameter is active, the fault (0x0002) is stored, i.e. it must be reset with the appropriate message class (0x0004).
0x0006	DelayEnable	Delay in seconds after enable
0x0007	DelayMessage	Minimum time that a fault must be present before a message is actually generated (flutter protection).

6.1.6 SwitchCommand (Digital outputs)

MemberID	Member Name	Description
0x0000	ValueDetection	This parameter can be used to deactivate the detection of PresentStage (0x000A) and Fault (0x0001) parameters. In this case, the Fault member is also writeable. PresentStage (0x000A) is set equal to SetpointStage (0x000B).
0x0001	Fault	Indicates a fault. Is generated if the PresentStage fails to follow the SetpointStage within the runtime (DELFB).
0x0002	RemoteActuating	If inactive, the controller has no access to the hardware. The present state is displayed, and feedback signal monitoring is suppressed (0x0001). The "COM" output is set to step 0.
0x0003	UserAccess	Specifies operation privilege. The member step setpoint (0x000B) can only be changed in "Man". 0=Hand, 1=Auto
0x0004	SupressFeedback	Suppresses runtime monitoring (0x0001)
0x0005	Forcing	Indicates that override control is active. The application specifies the step setpoint.
0x0006	Optimizing	Activates and deactivates the optimization function.
0x0007	MessageClass	Fault message class (0x0001)
0x0008	ApplicationControl	Indicates that the step setpoint (0x000B) is specified by the application in automatic mode (0x0003).
0x0009	OptDirectionHigh	Optimization is achieved by stepping up.
0x000A	PresentStage	Switching command feedback signal
0x000B	SetpointStage	Indicates the present step setpoint. Can be changed by the ObjectHandler if 0x0003 = TRUE.
0x000C	OptimizeStage	Specifies the optimization step.
0x000D	MaxStage	Maximum permissible switching step. 1 signifies, *for example 0=off and 1=Step 1 is permitted*.

6.1.7 Counter

MemberID	Member Name	Description
0x0000	ValueDetection	This parameter can be used to deactivate the detection of parameter 0x0001. This member is then also writeable.
0x0001	ValueFault	Active indicates that this counter value is in an error state.
0x0002	HighLimitActive	Indicates that the value is above the alarm limit (0x000E).
0x0003	CountValueLost	Indicates that the counter value has missed pulses.
0x0004	UserAccess	Must be set to "Man" in order to delete (0x0006) or set (0x0007) the counter value. Always set to "Man" by default. 0=Hand, 1=Auto
0x0005	OverflowCounter	Indicates an overflow of the internal counter.
0x0006	EraseCounter	Sets the counter to zero.
0x0007	SetCounter	Adds the offset (0x000C) to the present counter value (0x000B)
0x0008	MessageClass	Fault message class (0x0001)
0x0009	Me.ClassHighLimit	Limit for the resultant value (0x000A)
0x000A	PresentValue	Resultant value of the counter (dimensioned)
0x000B	CounterValue	Internal pulse counter value
0x000C	OffsetCounter	Offset that is added to the present counter value (0x000B) during setting (0x0007)
0x000D	ImpulseValue	Pulse counter. The resultant value 0x000A is calculated from this value and member 0x000B.
0x000E	HighLimit	Resultant value high limit

6.1.8 Time Plan: Day

MemberID	Member Name	Description
0x0000	AggregateName	Name of the controlled unit
0x0001	Valid	TRUE if the schedule is valid and active
0x0002	Hour	Switching hour
0x0003	Minute	Switching minute
0x0004	Stage	Value that should apply from the point in time indicated

6.1.9 Time Plan: Week

MemberID	Member Name	Description
0x0000	AggregateName	Name of the controlled unit
0x0001	Valid	TRUE if the schedule is valid and active
0x0002	StartDay	Starting point: day of week (0=Mon … 6=Sun)
0x0003	StartHour	Starting point: hour
0x0004	StartMin	Starting point: minute
0x0005	EndDay	End point: day of week (0=Mon … 6=Sun)
0x0006	EndHour	End point: hour
0x0007	EndMin	End point: minute
0x0008	Stage	Value that should apply during the period indicated

6.1.10 Time Plan: Year

MemberID	Member Name	Description
0x0000	AggregateName	Name of the controlled unit
0x0001	Valid	TRUE if the schedule is valid and active
0x0002	StartDay	Starting point: day
0x0003	StartMonth	Starting point: month
0x0004	StartHour	Starting point: hour
0x0005	StartMin	Starting point: minute
0x0006	EndDay	End point: day
0x0007	EndMonth	End point: month
0x0008	EndHour	End point: hour
0x0009	EndMin	End point: minute
0x000A	Stage	Value that should apply during the period indicated

6.1.11 LoopController

MemberID	Member Name	Description
0x0000	Enable	Enables the controller for closed-loop control.
0x0001	Fault	Indicates the stored fault.
0x0002	MessageClass	Fault message class (0x0001)
0x0003	Hand	If this member is set, the controller is deactivated.
0x0004	InvertProportional	Used to invert the control algorithm. Additionally, the behavior in the disabled state also changes. *Can be used for limiting controllers, for example*.
0x0005	Status	Indicates the controller's status. If multiple states are active, the priority of the listed numbers applies, i.e. the highest priority wins. Value Meaning Priority 0 Controller disabled 5 1 Controller at high limit 3 2 Controller at low limit 2 3 Within control range 5 4 Control element not available 4
0x0006	PresentValue	Present value
0x0007	Setpoint	Setpoint
0x0008	CTRLOutput	Present requested position setpoint of the control element (controller output)
0x0009	ProportionalFactor	Proportional factor (gain) of the PID-controller
0x000A	IntegralFactor	Integral factor; integral-action time in seconds (0=I-component deactivated)
0x000B	DifferentialFactor	Differential factor in seconds (0=D-component deactivated)
0x000C	HighLimit	Maximum permissible positioning signal output value
0x000D	LowLimit	Minimum permissible positioning signal output value

6.1.12 CascadeController

MemberID	Member Name	Description
0x0000	Enable	Enables the controller for closed-loop control
0x0001	Fault	Indicates the stored fault
0x0002	ApplicationControl	Indicates that the setpoint (0x0009) is specified by the application in automatic mode (0x0003).
0x0003	UserAccess	Specifies operation privilege. The member setpoint (0x0009) can only be changed in “Man”.
0x0004	MessageClass	Fault message class (0x0001)
0x0005	Hand	If this member is set, the controller is deactivated.
0x0006	Status	Indicates the controller’s status. If multiple states are active, the priority of the listed numbers applies, i.e. the highest priority wins. Value Meaning Priority 5 Controller disabled 5 6 Controller at high limit 3 7 Controller at low limit 2 8 Within control range 5 9 Control element not available 4
0x0007	PresentValue	Present value
0x0008	Setpoint	Valid setpoint
0x0009	BasicSetpoint	Basic setpoint; can be changed by the ObjectHandler if 0x0002 = TRUE.
0x000A	CTRLOutput	Present requested position setpoint of the control element (controller output)
0x000B	ProportionalFactor	Proportional factor (gain) of the PID-controller
0x000C	IntegralFactor	Integral factor; integral-action time in seconds (0=I-component deactivated)
0x000D	WorkingPointDiff	Operating point difference
0x000E	HighLimit	Maximum permissible positioning signal output value
0x000F	LowLimit	Minimum permissible positioning signal output value
0x0010	DeadZone	Dead zone between the upper and lower setpoints. Calculated from the basic setpoint 0x0009.

7 OPC tag translation

7.1 Air Handling Units

OPC tags for Siemens LB20 application.

7.1.1 Setpoints, Temperature

OPC tag name	Description	Object type
TSC1	HeatingComfort	
TSC2	CoolingComfort	Setpoint: Real
TSE1	HeatingEconomy	“
TSE2	CoolingEconomy	
GE46	Setpoint HRC frost protection	Setpoint: Real
TS80	Setpoint frostprotection, operating temperature	“
TS81	Setpoint frostprotection, keeping warm	

7.1.2 Setpoints, Pressure / Flow

OPC tag name	Description	Object type
VS10	Setpoint flow supply air lowspeed	Setpoint: Real
VS11	Setpoint flow supply air highspeed	“
VS20	Setpoint flow exhaust air lowspeed	
VS21	Setpoint flow exhaust air highspeed	

7.1.3 General settings / values

OPC tag name	Description	Object type
GE01	FrostAlarmValue	Setpoint:Real/Enum
GE22	RoomSetpoint	“
GE28	ExtendRunTime	
GE30	LimitClgUnoccupied	
GE31	LimitHtgUnoccupied	
GE39	SupTOAComp	
GE42	TempAlarmSet	
GE43	DeltaHeating	
GE44	DeltaCooling	
GE46	HRFrostSetpoint	
GE59	HREff_Alm	
GE61	HRC_Efficiency	
GE62	CompStartPoint	
GE63	CompStopPoint	
GE64	VolSuLoDelta	
GE65	VolSuHiDelta	
GE66	VolExLoDelta	
GE67	VolExHiDelta	
GE68	PressSuLoDelta	
GE69	PressSuHiDelta	
GE70	PressExLoDelta	
GE71	PressExHiDelta	
GE72	VolAlarmSet	
GE73	PressAlarmSet	
G121	CancelExtendOp	
G122	ForcedRunTime	
G123	SupMinLimit	
G124	SupMaxLimit	
G125	ExtMinLimit	
G126	ExtMaxLimit	
G127	CancelForcedOp	
G128	SupFiltAlm	
G129	ExtFiltAlm	

7.1.4 Temperature

OPC tag name	Description	Object type
GT10	SupplyAirTemp	Messure
GT30	Room/ExtrTemp	“
GT41	HRCFrostTemp	
GT80	WaterFrostTemp	
GT90	OutTemp	
GT10	SupplyAirTemp	

7.1.5 Pressure / Flow

OPC tag name	Description	Object type
GF10	SupplyVol	Messure
GF20	ExtractVol	“
GP10	SupplyPressure	
GP15	SupFilterPress	
GP20	ExtractPressure	
GP25	ExtFilterPress	

7.1.6 Analog Inputs, Others

OPC tag name	Description	Object type
GQ10	SupplyCO2	Messure
GQ20	ExtractCO2	

7.1.7 Analog Outputs

OPC tag name	Description	Object type
SV10	Heating	PosCommand
SV20	Cooling	“
HD10	Heating recovery (HRC)	
FO10	Frequency converter Supply fan	
FO20	Frequency converter Exhaust fan	

7.1.8 Digital Outputs

OPC tag name	Description	Object type
ST10	Out door damper	SwitchCommand
OP02	Fan	“
DX10	DX 1	
DX20	DX 2	
EB12	ElecHeaterStage2	
EB13	ElecHeaterStage3	
HD10	HeatRecovery	

7.1.9 Digital Inputs

OPC tag name	Description	Object type
	Not implemented	Setpoint: Enum

7.1.10 Controllers

OPC tag name	Description	Object type
	Not implemented	LoopController

7.1.11 Alarms

OPC tag name	Description	Object type
AL00	Reset Alarms	Setpoint: Enum
AL01	LmFireSmoke	Message
AL02	LmRotorGuardAlarm	“
AL06	LmErrorSupplyFu	
AL07	LmErrorExtractFU	
AL08	LmSensorError	
AL09	LmTempAlarm	
AL10	LmFrostAlarm	
AL11	LmUnitOverRideAlarm	
AL13	LmHRCFrostAlarm	
AL14	LmHRC_EffAlarm	
AL15	B_Alarm	
AL16	A_Alarm	
AL27	LmFanCommonFault	
AL28	LmElecHtrO/H	
AL29	LmElecHtrFire	
AL30	LmSupFilter	Message
AL31	LmExtFilter	

7.1.12 Alarm delay time

OPC tag name	Description	Object type
	Not used	Setpoint: Real

7.1.13 Actual Operation mode / Setpoints

OPC tag name	Description	Object type
OP01	StartStop	Setpoint: Enum
OP02	Fan	“
OP03	ExtendedOp	
OP04	TempCtlrType	Messure
OP06	ActualSetpoint	Setpoint: Enum
OP07	OP_Mode	Messure
OP08	ActualStpSu	Setpoint real
OP09	ActualStpEx	
OP12	ExternalStop	Setpoint: Enum
OP16	ForcedOp	
OP17	SupFanMode:	
OP18	ExtFanMode:	

7.1.14 Operation mode control

OPC tag name	Description	Object type
TB01	BMS override timeprogram 0 = Internal TSP, 1= Off, 2 = Eco St1 3 = Eco St2, 4 = Comf St1, 5 = Comf St2	Setpoint: Enum
TB02	Saphir override timeprogram 0 = Internal TSP, 1= Off, 2 = Eco St1 3 = Eco St2, 4 = Comf St1, 5 = Comf St2	“
TB03	Emegency stop via communication 0 = Off/Normal, 1= Stop	

7.1.15 Time program

OPC tag name	Description	Object type
TD0x	Air handling unit, dayplan 0 = Off, 1 = Eco St1, 2 = Eco St2 3 = Comf St1, 4 = Comf St2	Time plan
TW0x	Air handling unit, weekplan	“
TY0x	Air handling unit, yearplan	
SD0x	SMS alarm routing, dayplan 0 = Off, 1 = Tel1, 2 = Tel2, 3 = Tel3, 4 = Tel4	
SW0x	SMS alarm routing, weekplan	
SY0x	SMS alarm routing, yearplan	
ED0x	External device, dayplan 0 = Off, 1 = On	
EW0x	External device, weekplan	

7.1.16 General

OPC tag name	Description	Object type
AC01	Air conditioning	
AHU1	Air handling unit 0 = Off, 1 = Eco St1, 2 = Eco St2 3 = Comf St1, 4 = Comf St2	Unit

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