Manual TD/CEM-DAS-DI-EN Rev. A

CEM-DAS – Digital interface Data acquisition and handling system for continuous emission monitoring – Software version 1.2.4

Performance-tested program system for acquisition and handling of continuous emission data

Measurement made easy



CEM-DAS – Digital interface

Data acquisition and handling system for continuous emission monitoring – Software version 1.2.4

Manual

TD/CEM-DAS-DI-EN Revision A Edition June 2017

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1 Introduction

1.1 Digital interface

This document describes the parameterization and application of the digital interface in the product CEM-DAS / DAA pursuant to the guideline VDI 4201 "Performance criteria on automated measuring and electronic data evaluation systems for monitoring emissions".

At this time, only the connection of the automated measuring system (AMS) via Modbus pursuant to VDI 4201 Part 3 is realized. Modbus via TCP/IP (hereafter abbreviated "Modbus TCP") and Modbus RTU via serial interface (hereafter abbreviated "Modbus RTU") are supported.

If the connection is established via Modbus RTU a protocol converter (see Section 6) is required for serial communication with the AMS.

1.2 Protocol converter

The protocol converter UNIGATE CL-FE manufactured by Deutschmann Automation is used (see /3/). It is connected via Ethernet to DAA and via its serial interface to the AMS. A Modbus TCP server runs on the Ethernet side, which receives requests from DAA and forwards them via Modbus RTU as a Modbus RTU master.

The script file "UNIGATE-TCP-RTU.DCS" must be loaded on the protocol converter. This is then executed in the data execution mode of the device.

8 data bits, 1 stop bit and 1 start bit are permanently set on the RS interface of the UNIGATE CL-FE. The baud rate, parity and interface type can be set via the rotary code switches (see Section 6.2.3).

1.3 Terms and abbreviations

The abbreviations and terminology pursuant to VDI 4201 (see /1/ and /2/) apply.

The following applies for the purpose of disambiguation of the abbreviation AMS:

- AMS refers to the automatic measuring system according to item 3 in /1/.
- AMS-T7 refers to an "analog" entity in DAA.

2 System overview

2.1 Functions overview



Figure 1: CEM-DAS / DAA and their environment

The external interfaces of DAA are summarized in the context diagram depicted in Figure 1.

The users can parameterize the AMS for CEM-DAS / DAA and check its current status via the web browser. They can also define simulation data or apply reference material.

2.2 Configuration

DAA always communicates with the AMS via Modbus TCP. A protocol converter is used in case the AMS can only communicate via Modbus RTU. The converter reads in the request from DAA and forwards it via Modbus RTU to the AMS. The reply of the AMS is then sent back to DAA via Modbus TCP.

The Modbus RTU address of the AMS is included in the Modbus TCP telegram, so that the gateway can correctly address the AMS.



Figure 2: Modbus TCP



Figure 3: Modbus RTU

The following applies:

- DAA always works as a Modbus TCP client.
- The AMS always works either as a Modbus TCP server or as a Modbus RTU slave.
- The protocol converter works as a Modbus TCP server on one side and as a Modbus RTU master on the other side.

2.3 DAA

All direct communication with the AMS occurs via a DAA. This means that DAA permanently communicates with the AMS and provides the current state of the AMS to the user. The following tasks are performed by DAA.

2.3.1 Initializing phase

After startup of DAA or after an interruption of the communication DAA will retrieve the device parameters (meta data) from the AMS. After this initialization DAA will proceed to the operation phase.

2.3.2 Operation phase

DAA will cyclically perform the following actions in the operation phase. Pursuant to VDI 4201 Part 1 the cycle time must not exceed 1 second.

- 1. Retrieval of measurement signals (value on status) from the AMS and further processing of the signals
- 2. Status inquiry of the reference application in this AMS. This status is then forwarded to CEM-DAS.
- 3. If the user has defined new simulation data or ended the simulation, this change will be transmitted to the AMS.
- 4. If the user has applied new reference material or has ended the application of reference material, this change will be transmitted to the AMS.

DAA will switch into initializing phase in case there is a communication error with the AMS during operation phase.

2.3.3 System messages

A system message will be displayed by DAA upon a change in the operation mode of the AMS. This message shows the new operation mode. The following operation modes can be reported:

Operation mode	Description
with reference material	There is only one application of reference material.
in simulation	The status "Test operation, simulation measuring value" is set for
	at least one measurement component.
in normal operation	There is no application of reference material, and the status "Test operation, simulation measuring value" is not set for any meas-
	urement component.

Table 1: Operation modes of the AMS

3 Parameterization

All required parameterization takes place via the web interface of CEM-DAS.

3.1 Device

The AMS must be parameterized as a device in DAA before it can be used. The parameterization form consists of three sections. In the first section, general settings of the AMS are parameterized. In the second section, the measurement components are created and the measurement signals and status signals are allocated to an AIN or BIN of DAA. In the third section the created measurement components are allocated to the measurement components of the AMS.

3.1.1 General

General - ACF5000-	1		8
ID:	10	Revision:	2017-01-24 12:21
Туре:	Digital Interface Modbus	Designation:	ACF5000-1
IP address:	192.168.0.200	IP Port:	502
Modbus RTU:		Address RTU:	
		Newm	easurement component Delete measurement component

Figure 4: AMS general

After the new device has been created and the type has been set to "Digital interface Modbus" the form depicted in Figure 4 will be displayed. The type of Modbus communication and the required parameters are entered in this form.

Parameter	Range	Default	Remark
IP Address			IP4 address of the AMS or of the protocol converter.
IP Port	1 – 65535	502	IP port number of the AMS or of the protocol convert-
			er. Port 502 is the standard value for Modbus TCP.
Modbus RTU	bus RTU Yes / No No	No	If this input is activated the AMS will be connected via
			for Modbus TCP.
Address RTU	1 – 247		Modbus RTU address of the AMS. The protocol con-
			verter limits the RTU address to this range.

Table 2: General parameters

In the second section, measurement components can be created or existing measurement components can be deleted with the two control buttons.

3.1.2 Measurement components

The measurement components of the AMS and their receipt in DAA are parameterized in this section. A maximum of 30¹ measurement components can be parameterized.

-	Measurement components														
		H2OACF	CO2ACF	CH4ACF	COACF	NOACF		NO2ACF		SO2ACF		N2OACF	h	1 8 from 13	
	М	easurement sign	al			_	_	_		_		_			i,
		Name:	H2OACF					Order:	1						
		Plant:	ACF Testinstanz		~			AIN:	Hum	idity			~		
	St	tatus signals													
	Des	signation				F	Plant					BIN			L
	Fail	ure				ſ	ACF Testi	nstanz		•	~	Select		~	1
	Mair	ntenance				ſ	ACF Testi	nstanz		•	~	Select		~	
	Mair	ntenance needed				ſ	ACF Testi	nstanz		•	~	Select		~	
	Spe	c. violated				ſ	ACF Testi	nstanz			~	Select		~	
	Sim	ulation				ſ	ACF Testi	nstanz			~	Select		~	

Figure 5: AMS measurement components

An existing AIN can be allocated to a measurement component in the section "Measurement signal". This AIN then contains the scale value of the measurement component and can be converted into a physical value via a calibration curve. The status signals of the measurement component can be allocated to an existing BIN in the section "Status signals". The status signals "Maintenance", "Malfunction", "Simulation" and "Specification violated" are automatically considered for the measurement signal. If maintenance or malfunction appear in 50% of the time of a measured values sequence the measured value will automatically be classified as maintenance or malfunction.

Upon its first occurrence within a measured values sequence the status signal "Simulation" will set the relevant status bit of the measured value. Upon its first occurrence the status signal "Specification" will set the status bit "Current plausibility", but does not invalidate the measured value.

3.1.3 Assignment

The parameterized measurement components are allocated to the measurement components of the AMS in the section "Assignment to the AMS (Analyzer)".

Assignment to the AMS (Analyzer)		
Measurement component	Analyzer Component / No Designation (Display Range)	
H2OACF	<no assignment=""></no>	▼
CO2ACF	<no assignment=""></no>	✓
CH4ACF	<no assignment=""></no>	✓
COACF	<no assignment=""></no>	✓
NOACF	<no assignment=""></no>	
NO2ACF	<no assignment=""></no>	✓
SO2ACF	<no assignment=""></no>	✓
N2OACF	<no assignment=""></no>	✓
HCIACF	<no assignment=""></no>	✓
NH3ACF	<no assignment=""></no>	✓
HFACF	<no assignment=""></no>	▼
CACF	<no assignment=""></no>	
02ACF	<no assignment=""></no>	×

Figure 6: AMS assignment

¹ Only meta data for 30 measurement components are available pursuant to VDI 4201 Part 3.

The information shown in the second column is only displayed after DAA has read out the meta data of the AMS. With this allocation it is possible to harmonize the sequences of the measurement components in DAA and the AMS. Entries in the second column are structured as follows: "Sequence in AMS" "Name of Component" (Measuring range bottom-up unit). The component's sequence, name, measuring range and unit are provided in AMS by the meta data.

3.2 AIN

The allocation of the AMS measurement signal is also shown in the parameter form of the AIN and can also be performed there.

-	General - Humidity				8
		11	Revision:	2017-01-24 12:21	
	Plant:	ACF Testinstanz	Plant ID:	1	
	EKB:	H2OACF	Designation:	Humidity	
	Substitute value type:	No substitute value	Substitute value:	0	
	Lower verification:	Plausibility V	Lower threshold:	-300	
			Lower hysteresis:		
	Upper verification:	None 🗸	Upper threshold:		
			Upper hysteresis:		
-	Event				
	Lower plausibility::				
	PU Event text:				
	Upper plausibility:				
	PO Event text:				
-	Assignment				8
	Device:	ACF5000-1	KKS:		
	Connector block:	H2OACF V	Туре:	IEEE DS Scale value	
	Designation:				

Figure 7: AIN assignment

3.3 BIN

The allocation of the AMS measurement status is also shown in the parameter form of the BIN and can also be performed there.

-	General - Dust1			8
		40	Revision:	2017-01-24 12:21
	Plant:	ACF Testinstanz V	Plant ID:	1
	EKB:	Dust1	Designation:	Dust1
	Substitute value:	Binary False (not set)	negate Input:	
			Filter:	0 ~ s
-	Event			
	State:		Туре:	<select type=""> V</select>
	Event text:			
-	Assignment			
	Device:	ВК9050 🗸	KKS:	
	Connector block:	Slot 3:DI02	Туре:	DI
	Designation:			



4 Status monitor

4.1 General

The current status of the AMS can be checked in the tab "State" in the menu item "Output/ Status Monitor"². This form is visible for all CEM-DAS users. It is a read-only form.

Reference material can be applied and simulation values can be entered in a second tab, "Simulation/Reference material". This tab is only visible to CEM-DAS managers or users with proper authorization.

4.2 Status

The current scale values, measurement status, measurement signals and the AMS mode are displayed. The AMS mode is determined by DAA and indicates whether a simulation or reference application is in place. If none of these two modes is in place the AMS is in "Normal operation".



Figure 9: AMS status control

The "AMS Mode" display is color-coded as follows:

Green: AMS in normal operation

Yellow: AMS in simulation mode or application of reference material

Red: There is no connection to the AMS

² This menu item is visible if a device "Digital Interface" is configured.

4.3 Changes

The user can enter simulation data for each measurement component or apply reference material in the tab "Simulation/Reference material". It is not possible to simultaneously use simulation data and reference material. Also, the simulation can be ended and reference material can be switched off in this tab.

Status Monitor				
AMS Status Monitor				
DAA:	DAA 1 🗸	AMS:	ACF5000-1 V	
Device parameter				
Manufacturer:		Identifier:		
Description		Version:		
Serial number:		Components:	0	
State Simulation/Reference mate	erial			
AMS Configuration:	Reference material activated V		Save Send co	onfiguration
Designation Low. disprayed	p. Max Range Unit	Simulation SimScale	SimValue SimWar	SimFail
	No items	s in list!		
				^
				×
Number	Reference material		Activa	te
0				
1				
2				
3				
4				
5				~
6				

Figure 10: AMS simulation / reference material

After selecting "Simulation mode" for "AMS Configuration" the simulation data can be edited. The simulation data can be entered either as scale values "SimScale" or as physical values "SimValue". Conversion into the other value happens automatically.

After selecting "Reference Material activated" for "AMS Configuration" the desired reference material can be activated in the lower list. In addition, the reference materials can be named.

Simulation operation or activation of reference material are ended by selecting "Normal Operation" for "AMS Configuration".

4.3.1 Sending

Settings or changes are sent to DAA by clicking "Send configuration" (see Figure 10). A process window will pop up, where messages relating to the transmission status are displayed.

	Transfer of parameters - Status	
P	Progress display	
Ir	6 - Upload program was successfully started	
Ш		
II.		
		Close
		01030

Figure 11: Set AMS mode

After sending, the answer from DAA will be awaited. DAA will then forward the settings or changes to the AMS.

At the end of a day DAA will always reset the AMS into normal mode, which means that existing simulations or reference applications are discarded.

5 Data model

5.1 Measurement signal

Pursuant to 5.2 in /1/, the measurement signal of the AMS is transmitted as a scale value. The zero point is set to scale value 0 and the end of the nominal range is mapped to +10000. The scale value can be converted into the measurement signal with the following formula:

 $Measurement \ signal = \left(\frac{Scale \ value}{10000}\right) * End \ of \ nominal \ range$

The scale value is not limited by the AMS and must not be limited in the evaluation system either.

Pursuant to 5.2.1 para 2 item 3 the scale value must be saved in the evaluation computer. In CEM-DAS this value is stored as an input value with its measured value, much like a "current value". It can then be displayed via the values list "Input Values"³.

The calibration function is determined by the authority according to the scale values, which means that the calibration function converts the scale values into the (physical) measured values.

5.2 Unit

The scale value's unit can be modified in an AMS-T7 in the input position "Input Unit". The default setting upon creation of the AMS-T7 is "mA".



Figure 12: Scale value's unit

³ Corresponds to the previous values list "Current Values".

6 Protocol converter

6.1 Connections

6.1.1 Supply voltage

The 4-pin plug adapter for the supply voltage is located on the bottom of the protocol converter. The device must be supplied with 10 - 33 VDC (DC voltage, standard power adapter pursuant to DIN 19240). Pins 1 and 2 must be used.

Pin number	Name	Function
1	UB (Pwr)	10 to 33 V DC
2	0 V (Pwr)	0 V DC
3	Rx - debug	Receive signal debug ⁴
4	Tx - debug	Transmit signal debug

 Table 3: Pin assignment for supply voltage

6.1.2 Ethernet interface

The plug "RJ 45 Ethernet" for Ethernet connection is located on the bottom of the protocol converter. The device supports 10/100 MB and "auto crossover".

Pin number	Name	Function
1	TD+ (RD+)	Transmit line + (Receive line +)
2	TD- (RD-)	Transmit line – (Receive line –)
3	RD+ (TD+)	Receive line + (Transmit line +)
4		
5		
6	RD– (TD–)	Receive line – (Transmit line –)
7		
8		

Table 4: Pin assignment Ethernet interface

6.1.3 RS Interface

The (serial) RS interface (3-pin + 4-pin plug adapter) is located on the topside of the protocol converter and must be connected to the S5 master.

This interface can be used as either RS232, RS422 or RS485. For RS485, the two pins "485+" resp. "485–" must be connected together.

In addition, the terminating resistors (termination Rx 422 and Tx 422) must be set correctly for RS422 and RS485.

⁴ At isolated devices (option GT) Ground for the Debug-Interface must be connected with pin 3 of the RS-interface. At devices that are not isolated also the 0 V (Pwr) signal can be used as reference.

Pin Number	Name	Function
1	Rx 232	Receive signal
2	Tx 232	Transmit signal
3	GND	Ground signal
4	Rx 422+ (485+)	Receive signal
5	Rx 422– (485–)	Receive signal
6	Tx 422+ (485+)	Transmit signal
7	Tx 422– (485–)	Transmit signal

Table 5: Pin assignment RS interface

6.2 Operating modes

The protocol converter /3/ can be used in various operating modes. The operating mode is determined by means of the rotary code switches when the protocol converter is started / switched on.

S4	S5	Operating mode
D	D	Reserved
E	E	Test mode⁵
F	F	Configuration mode ⁵
0 – B	0 – B	Data exchange mode ⁶

Table 6: Operating modes

6.2.1 Configuration mode

This mode is used for configuration of the protocol converter. It is started when both rotary code switches S4 and S5 are in position "F" upon start. In this mode, the device will work in a fixed setting with 9600 baud, no parity and 1 stop bit. The RS state LED will continually blink in red. The following operations are possible in this mode when the WINGATE program is connected to the RS interface of the device.

🔏 WINGATE (Wingate.wcf)					
File Options Extras H	elp				
🗖 more items visible	Г	more items	editable		
Parameter	Value				
Software revision	V 5.3				
Device type	Fast Etherne	et(Script)			
Script revision	36				
Serial Number	36110569				
Script memory	16320				
Data memory	8192				
IP Address UNIGATE	192.168.0	.31			
Subnet-Mask	255.255.2	55.0			
IP Address Gateway	0.0.0.0				
RS-FE-CL (232/422/485) V5.3 [36] (c)dA Switch=0xFF Script(C:3001/16320,V:7118/8192)="S5-9600-8E1" Author="NIS/Eh" Version="V1.0" Date=14.05.2014 SN=36110569 IP=192.168.0.31 MAC=00-14-11-6D-42-F9 Data-Flash=1MByte					
upload finished		64 bytes	COM10	V 2.73 (388)	1.

Figure 13: Start of WINGATE

Configuration is also possible via the debug interface (see 9).

⁵ These operating modes are not possible for RS422 or RS485 operation.

⁶ The positions can be retrieved and used by the application.

6.2.1.1 General configuration

After WINGATE has been started the parameters displayed in bold can be modified by double-clicking them.

🔏 WINGATE (Wingate.wcf)			
File Options Extras He	lp		
🗖 more items visible	🗖 more items editable		
Parameter	Value		
Software revision	V 5.3		
Device type	Fast Ethernet(Script)		
Script revision	36		
Serial Number	36110569		
Script memory	16320		
Data memory	8192		
IP Address UNIGATE	192.168.0.31		
Subnet-Mask	255.255.255.1 IP Address UNIGATE		
IP Address Gateway	0.0.0.0 IR Address LINIGATE		
	192.168.031_		
RS-FE-CL (232/422/485) V5	.3 [36] (c)dA Swit X Cancel 10-8E1"		
Author="NIS/Eh" Version="	/1.0" Date=14.05 -6D-42-F9		
Data-Flash=TMByte			
IP Address UNIGATE	64 bytes COM10 V 2.73 (388)		

Figure 14: WINGATE Change of IP address

The changes are then transmitted to the protocol converter using the command "Download (Write to Device)". The display of the parameters can be refreshed using the command "Upload (Read from Device)".

WINGATE (Wingate.wcf)		
File Options Extras Help		
Open	E more items editable	
Save		
Save as		
Close		
Upload (Read from Device)	ternet(Script)	
Download (Kead Holin Device)		
Write Script	63	
Printer options	8 0 31	
Print	5.255.0	
E×it D)	
RS-FE-CL (232/422/485) V5.3 [36] (c) Author="NIS/Eh" Version="V1.0" Date Data-Flash=1MByte)dA Switch=0xFF Script(C:3001/16320,V:7118/8192)=''S5-9600-8E1'' te=14.05.2014 SN=36110569 IP=192.168.0.31 MAC=00-14-11-6D-42-f	-9
IP Address UNIGATE	64 bytes COM10 V 2.73 (388)	

Figure 15: WINGATE Transmission of changes

6.2.1.2 Loading a script

The script is available as a file named "UNIGATE-TCP-RTU.DCS". It is transmitted to the protocol converter using the command "Write Script". After the script has been loaded the rotary code switches S4/S5 must be set according to the application and the protocol converter must be reset. Another way of loading the script file is shown in Section 8.

or a constant with a constant and a constant and a constant a con			-	. 🗆 🗙
File Options Extras Help				
Open Save Save as	nore items (editable		
Upload (Read from Device) Download (Write to Device)	net(Script)			
Printer options 58 Print 55	.0.31			
Exit				
Data stored in EEROM Restart RS-FE-CL (232/422/485) V5.3 [36] (c)d Author="NIS/Eh" Version="V1.0" Date Data-Flash=1MByte Konfigmode	A Switch=0xFF Scr =14.05.2014 SN=3/	ipt(C:3001/ 5110569 IF	16320,V:7118/8192)="S5-9600-8E1" =192.168.0.31 MAC=00-14-11-6D-42-F9	
download finished	64 bytes	COM10	V 2.73 (388)	1

Figure 16: WINGATE Transmission of a script

6.2.2 Test mode

The device will start in test mode if both rotary code switches S4 and S5 are in position "E" upon start. Please refer to page 13 in /3/ for additional information on the test mode.

6.2.3 Data exchange mode

This mode is always executed whenever the device is not in configuration or test mode. The loaded script will then be executed with the parameters set. After that, the two rotary code switches S4 and S5 will be evaluated by the application (script). The communication parameters for Modbus RTU are set via these switches. The rotary code switch S4 shows the communication baud rate. The rotary code switch S5 shows the communication type and parity. 1 start and stop bit and 8 data bits are fixed.

Position	Baud rate/ bits/s
0	2.400
1	4.800
2	9.600
3	19.200
4	38.400
5	57.600
6	115.000
7 – F	reserved

Position	Туре	Parity
0	RS232	Even
1	RS442	Even
2	RS485	Even
3	RS232	None
4	RS442	None
5	RS485	None
6	RS232	Odd
7	RS442	Odd
8	RS485	Odd
10 – E	reserved	
F ⁷	RS232	Even

Table 7: Rotary code switch S4

Table 8: Rotary code switch S5

⁷ The Modbus RTU slave UID is set fixed as 1. The UID sent via Modbus TCP is discarded (as of script version 1.3).

6.3 Status indication

The protocol converter has 11 LEDs with the following meanings.

LED	Color	Meaning
(Ethernet) Power	Green	Supply voltage Ethernet
Full Duplex	Green	Duplex communication
100 MB	Green	100 MB network
Link/Act.	Green	Link pulse found / data traffic
(Ethernet) State	Red / Green:	Interface status Ethernet:
	Permanent green	Connection established and active
	Flashing green	Device waiting for connection buildup
	Flashing green/red	Device waiting for Ethernet initialization
	Permanent red	General network error
Power	Green	Supply voltage RS interface
State	Red / Green:	System or application:
	Permanent green	-
	Flashing green	-
	Flashing green/red	-
	Permanent red	System error (LED error) / application error ⁸
	Flashing red	Configuration / test mode active
Error 1 / 2 / 4 / 8	Green	System error / application error
		Numbers 0 to 15 bit-coded

Table 9: LEDs on the protocol converter

6.3.1 System errors

Errors detected by the protocol converter are signalized with a red "State" LED. At the same time the error number is displayed bit-coded via the "Error" LEDs. In case of severe errors (1-5) the device must be switched off and on again. If the error occurs again the device must be replaced. In case of warnings (6–15) the LEDs will light up for 1 minute and will then be automatically reset.

LED 8 / 4 / 2 / 1	Error	Description
0000	0	-
0001	1	Hardware error
0010	2	EEPROM error
0011	3	Internal memory error
0100	4	Ethernet (fieldbus) hardware error
0101	5	Script error
0110	6	-
0111	7	RS transmit buffer overflow
1000	8	RS receive buffer overflow
1001	9	RS timeout
1010	10	General Ethernet (fieldbus) error
1011	11	Parity check or frame check error
1100	12	-
1101	13	Ethernet (fieldbus) configuration error
1110	14	Ethernet (fieldbus) data buffer overflow
1111	15	-

Table 10: System errors

⁸ In this case the red LED will flash with 0.5 Hertz.

6.3.2 Application

The application (script) sets the "State" LED as follows.

Color	Meaning
Off	Switched off during start.
Flashing green/red	Set before initialization of the network and the RS interface.
Flashing green	Application ready and waiting for telegrams on the network.
Permanent green	Request successfully completed.
Permanent red	Error during receipt of telegrams on RS interface. LEDs 8/4/2/1 are
	switched off.
Flashing red	Error on execution of a request.

Table 11: LED application

The application (script) tallies the requests of the measurement signals and status information with a counter from 0 to 15. After 15, the counter will restart at 0. The current counter is continually displayed on LEDs 1/2/4/8.

7 Related documents

No.	Document title
/1/	VDI 4201 Part 1 Digital interface – General requirements, September 2010
/2/	VDI 4201 Part 3 Digital interface – Specific requirements for Modbus, July 2012
/3/	Instruction Manual Universal Fieldbus Gateway UNIGATE [®] CL – Fast Ethernet V. 2.5,
	Deutschmann Automation GmbH & Co. KG

8 Annex A: Script programming tool

There is a small program called "Script Programming Tool" (SPT), which can also load a script as a DCS file to the UNIGATE CL-FE via the RS interface or the DEBUG interface. For this purpose, the protocol converter must be in data exchange mode. It is not necessary to switch on the configuration mode.

File Settings	
Download Script	
COM9 V1.52	

Figure 17: SPT for loading of scripts

Loading of a script is described in the following. First, the PC's serial interface that is connected to the UNIGATE CL-FE must be selected via the menu item "Settings".





Then the script file "UNIGATE-TCP-RTU.DCS" must be selected.



Figure 19: SPT Selection of the script file

After the script file has been selected the button "Download Script" must be clicked. A message will pop up, requesting the user to restart UNIGATE CL-FE (interrupt power supply). Please make sure to only confirm this message after restarting UNIGATE CL-FE.

	Spt 🔀
File Settings	Restart UNIGATE and confirm after message received.
Download Script	OK
сомя	v1.52 //

Figure 20: Start SPT download

After the restart SPT will search for UNIGATE CL-FE. As soon as it is found, a message "Debug Port connected" will appear in the status bar. The "State" LED on the UNIGATE CL-FE will no longer flash. After clicking the OK button the download of the script will commence.

script program state
programming with Handshake3649Byte
File
6
DebugPort connected V1.52

Figure 21: SPT download active

When the download is finished – a message will only pop up in case of an error – UNIGATE CL-FE must be restarted again, so that the loaded script is executed. The "State" LED on the UNIGATE CL-FE will flash again.

Remark: In case of any errors during script loading the program should be started in Windows 7/8 or Server 2008/2012 with administrator rights.

9 Annex B: Alternative configuration

In case WINGATE is not connected to the RS interface, but to the debug interface, the configuration can also be read, modified and transmitted. For this purpose the protocol converter must be in data exchange mode. It is not necessary to switch on the configuration mode. In this case, the commands in the menu item EXTRAS shall be used.



Figure 22: Retrieve configuration

After selecting "Upload_Config_Debug" the following message will pop up. The message can be confirmed by clicking OK after another restart of UNIGATE CL-FE.

WINGATE (Wingate.wo File Options Extras Help	f)		_ 🗆 X
🗖 more items visible	🗖 more items	editable	
Parameter	Value		
	1		
	WinGate		×
	Restart UNIGATE in Ru	n-Mode and	l confirm
	0	ĸ	
Waiting for Device	0 bytes	ICOM9	V 2.73 (388) 🏼 🎢

Figure 23: Upload via debug interface

As soon as the protocol converter detects WINGATE the message "Device started in WINGATE-Mode" will appear in the status bar. Upload of the configuration may take approx. 30 seconds. The message "Upload finished" will appear in the status bar once the upload is successfully completed.

WINGATE (Wingate.wcf) File Options Extras Help			_ 🗆 🗵
🗖 more items visible	🗖 more items (editable	
Parameter 📥 Value			
Device started in WINGATE-Mode	0 bytes	COM9	V 2.73 (388) //

Figure 24: Device started in WINGATE mode

📲 WINGATE (Wingate.wcf)						
File Options Extras He	lp					
\square more items visible	Г	more items e	editable			
Parameter	Value					
Software revision	V 5.3					
Device type	Fast Etherne	t(Script)				
Script revision	36					
Serial Number	36110569					
Script memory	16320					
Data memory	8192					
IP Address UNIGATE	192.168.0	.31				
Subnet-Mask	255.255.2	55.0				
IP Address Gateway	0.0.0.0					
RS-FE-CL (232/422/485) V5 Script(C:3649/16320,V:7144 Date=10.07.2014 SN=36110 Data-Flash=1MByte	.3 [36] (c)dA : /8192)=''S5-9 /569 IP=192.1	Switch=0x00 SLAVE'' Author='' 68.0.31 MAC=00	NIS/Eh'' \)-14-11-6D	'ersion=''V1.0'' •42-F9		
Upload finished		64 bytes	COM9	V 2.73 (388) //		

Figure 25: Upload of configuration finished

The changed configuration can then be loaded by using the command "Download_Config_Debug".

WINGATE	(Wingate.w	vcf)			
File Options	Extras He	lp.			
🗖 more iten	Firmware	e Script Exten	ision tems e	ditable	
Parameter	Upload_	Config_Debug			
Software revisio,	Downloa	id_Config_Del	bug		
Device type		FastEtherne	t(Script)		
Script revision		36			
Serial Number		36110569			
Script memory		16320			
Data memory		8192			
IP Address UNIC	ATE	192.168.0.	31		
Subnet-Mask		255.255.2	55.0		
IP Address Gate	way	0.0.0.0			
RS-FE-CL (232/4 Script(C:3649/16 Date=10.07.2014 Data-Flash=1MB	422/485) V5 3320,V:7144 4 SN=36110 yte	.3 [36] (c)dA 9 /8192)=''S5-9 569 IP=192.1	Switch=0x00 :LAVE'' Author='' 68.0.31 MAC=00	NIS/Eh'' V ŀ14-11-6D·	ersion=''V1.0'' 42-F9
Upload finished			64 bytes	COM9	V 2.73 (388)

Figure 26: Transmit configuration

The following message pops up after selecting "Download_Config_Debug". The message can be confirmed by clicking OK after a restart of UNIGATE CL-FE.

WINGATE (Wingate.)	₩cf)					_ 🗆 🗙	Ľ	
File Options Extras He	elp							
\square more items visible	Г	mor	e items e	ditable				
Parameter	Value							
Software revision	V 5.3							
Device type	Fast Ethernet	(Scrip	t)					
Script revision	36							
Serial Number	36110569							
Script memory	16320							
Data memory	8192							
IP Address UNIGATE	192.168.0.3	31						
Subnet-Mask	255.255.25	5.0	WinGate		N			×I
IP Address Gateway	0.0.0.0				43			
			Restart	UNIGATE	in Run-	Mode and o	onfirm	
RS-FE-CL (232/422/485) V5 Script(C:3649/16320,V:7144 Date=10.07.2014 SN=36110 Data-Flash=1MByte	.3 [36] (c)dA S /8192)=''S5-SI /569 IP=192.16	witch LAVE 58.0.3	T MAC=U		ОК J-42-F9			
Waiting for Device	1	64 by	tes	COM9	V 2.73	(388) 🥢		

Figure 27: Download via debug interface

A message "Download finished" will appear in the status bar after successful download of the configuration.

WINGATE (Wingate.wcf)					
File Options Extras He	lp				
\square more items visible	Г	more items e	ditable		
Parameter	Value				
Software revision	V 5.3				
Device type	Fast Etherne	t(Script)			
Script revision	36				
Serial Number	36110569				
Script memory	16320				
Data memory	8192				
IP Address UNIGATE	192.168.0	.31			
Subnet-Mask	255.255.2	55.0			
IP Address Gateway	0.0.0.0				
RS-FE-CL (232/422/485) V5 Script(C:0/16320.V:7144/81 Date=10.07.2014 SN=36110 Data-Flash=1MByte	.3 [36] (c)dA : 92)=''S5-SLA' 1569 IP=192.1	Switch=0x00 VE'' Author=''NIS 68.0.31 MAC=00	/Eh'' Versi)-14-11-6D	ion="V1.0" -42-F9	
Download finished		64 bytes	COM9	V 2.73 (388) //	

Figure 28: Download of configuration finished

After WINGATE has been closed, UNIGATE CL-FE must once more be restarted, so that the protocol converter is again in data exchange mode.

Remark: In case of any errors during upload/download of the configuration the program should be started in Windows 7/8 or Server 2008/2012 with administrator rights.

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