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NEWS

Monitoring of Remote Measurement Points using an RTU3041C

SIMATIC RTU3041C / TeleControl Server Basic V3.1

https://support.industry.siemens.com/cs/ww/en/view/109739240

Siemens Industry Online Support



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# 1 Introduction

## 1.1 Overview

### Starting point

The battery-powered SIMATIC RTU30X1C is used to monitor and control remote stations that are geographically distributed and not connected to a power supply network. The RTU30X1C can store process data and transmit it to a central station via mobile wireless or via the LAN interface and an external router.

Furthermore, the RTU30X1C has 4 additional digital outputs and supports position determination and time synchronization via GPS.

#### Requirements

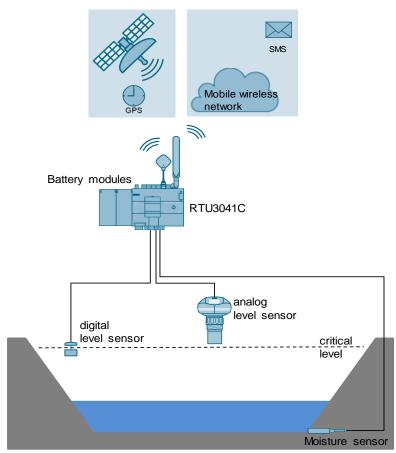
An RTU30X1C monitors the fill level of a rain overflow basin.

To conserve power, the RTU30X1C is in sleep mode much of the time, switching to an update or communication mode in predetermined cycles.

If the level exceeds a critical value, the RTU30X1C informs the operator by email and SMS, even outside scheduled communication cycles.

In addition, the RTU30X1C informs the operator via SMS when its predefined target position is reached. The actual position should be within a parameterized radius.

Figure 1-1 Level monitoring overview



### Use case

The RTU3041C uses an analog level sensor to monitor the level of a rain overflow basin. A digital moisture sensor starts the measurement.

In addition, a digital level sensor (float) is installed, which is activated when a critical level is exceeded.

At configurable, timed intervals, the RTU switches from sleep mode to update mode to read the inputs and process the program.

The position determination and the time synchronization of the RTU3041C is done via GPS.

Subsequently, the current data is sent to the TeleControl Server Basic (TCSB).

To read out the data of the TCSB, UaExpert is used as OPC UA Client.

### Solution approach

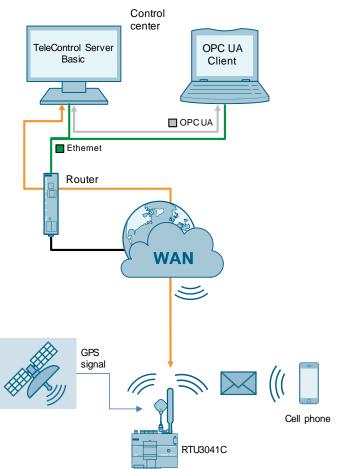
- An application program with the program blocks "Send email" and "Send SMS" implements the sending of emails and SMS messages.
- The position determination is done with the "GPS position" block. The block checks whether the RTU is moving outside the specified range.
- The RTU3041C is configured via the Web-Based Management (WBM) of the RTU.
- The blocks are graphically displayed and programmed via the Web-Based Management (WBM) of the RTU3041C.

## 1.2 Principle of Operation

### Diagram

The following figure shows the most important components of the solution schematically:

Figure 1-2



### Implemented functions

The following functions are implemented in the application example:

- Receiving a wake-up SMS to wake up the RTU3041C from sleep mode.
- Sending an email/SMS to a defined recipient when a critical level is exceeded or not reached.
- Time synchronization via GPS.
- Position determination of the RTU3041C via GPS.
- Sending an SMS to a defined recipient when the RTU3041C moves outside the defined range.

## 1.3 Components Used

This application example was created with the following hardware and software components: Table 1-1

Components	Quantity	Article number	Note
SIMATIC RTU3041C	1	6NH3112-4BB00-0XX0	The SIMATIC RTU3031C (6NH3112-3BB00-0XX0) can also be used.
Battery module housing	2	6NH3112-3BA00-1XX2	2 pieces per RTU
Battery	4		2 pieces per battery module housing (e.g., SAFT LSH20)
Mobile wireless antenna	1	6NH9860-1AA00	
Antenna ANT895-6ML	1	6GK5895-6ML00-0AA0	For receiving GPS position and time information
SIM card	1		Any mini SIM card with a data option
SITRANS LU150 analog level sensor	2	7ML5201-0FB0	Up to 5 m
Digital level sensor	2		Available from specialist dealers
Digital moisture sensor	1		Available from specialist dealers
SCALANCE M816-1	1	6GK5816-1AA00-2AA2	Another DSL router can also be used.
TeleControl Server Basic 8 V3.1, Update 3	1	6NH9910-0AA31-0AA0	
UaExpert	1	Freeware	Download at https://www.unified- automation.com/downl oads/opc-ua- clients.html

This application example consists of the following components:

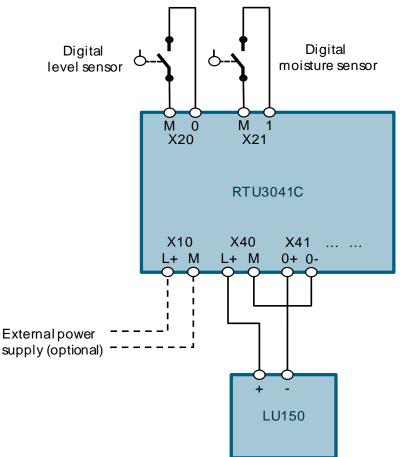
Table 1-2

109739240_RTU3041C_TCSB_DOC_V30_en.pdf	This document
109739240_RTU3041C_TCSB_PROJ_V30.zip	Configuration file of the RTU3041C

# 2 Engineering

## 2.1 Hardware Setup

<u>Section 1.3</u> lists the required hardware components. The following diagram shows the hardware setup of the RTU3041C. Figure 2-1: Circuit diagram RTU



- 1. Insert the SIM card into the RTU3041C.
- 2. Insert two batteries at a time into a battery module housing.
- 3. Mount the RTU3041C and, to the left of it, the battery module housing on a top-hat rail.
- 4. Connect the digital level sensor to the terminal block X20.
- 5. Connect the digital moisture sensor to terminal block X21.
- Connect the analog level sensor to terminal blocks X40 and X41. For instructions on how to operate the SITRANS LU150, refer to the instruction manual: <u>https://support.industry.siemens.com/cs/ww/en/view/109739505</u>.
- 7. Connect the antennas to the RTU3041C.
- 8. Connect the battery module housing to the RTU3041C.

**Note** You can also operate the RTU3041C with an external power supply instead of batteries. To do this, connect the external power supply with DC 12 to 24 V to terminal block X10 IN.

**Note** Connection examples for other sensors can be found in the instruction manual:

https://support.industry.siemens.com/cs/ww/en/view/109750942.

The following table provides an overview of all IP addresses used in this example. Assignment of static IP addresses is assumed.

Table 2-1

Components	IP address	Description
Engineering station	192.168.0.100	<ul> <li>TeleContol Server Basic</li> <li>OPC UA Client</li> </ul>
RTU3041C	192.168.0.3	Access to WBM

The subnet mask in all network components is 255.255.255.0.

**Note** Adjust the IP addresses of the components in your project so that they are on the same subnet.

## 2.2 Configuration and project planning

This section describes the most important steps of the configuration:

- Configure the SIMATIC RTU3041C (<u>Section 2.2.1</u>) or load the supplied configuration file (<u>Section 2.2.4</u>)
- Configuring the TeleControl Server Basic (Section 2.2.2)
- Configure OPC UA Clients (UaExpert) (Section 2.2.3).

### 2.2.1 Configuring the SIMATIC RTU3041C

This section shows you all necessary steps to configure the RTU3041C for the application described here.

Note	The supplied project "109739240_RTU3041C_ PROJ_V30.zip" contains the
	finished configuration file ("*.cfg"), which you can load into your RTU3041C and
	adapt to your application in just a few steps (see Section 2.2.4).

This section is for information only.

### Note Insert a SIM card into the RTU3041C before configuring.

For each RTU, you need a SIM card with data option. You can obtain this from your mobile provider.

### **General configuration**

- 1. Connect the RTU3041C to your PG/PC via a network cable.
- **Note** If you are using multiple RTUs, address conflicts may occur during initial startup because each RTU is assigned the same IP address by default. Therefore, during commissioning, ensure that only one RTU is connected to your network at a time.
  - 2. If necessary, change the IP address of your PG/PC (according to <u>Table 2-1</u>) so that it and the RTU3041C are in the same subnet.
  - 3. Wake up the RTU3041C by briefly pressing the WKUP/RESET button on the RTU3041C.
  - 4. In a browser, open the web server of the RTU3041C at the address "<u>192.168.0.3</u>".

5. Log in with the username "admin" and the password "admin".

Login	
L og in	
Log in	
► Log in Enter your user name and your password. Then click the "Login" button.	
User name	
Password AI	

SIMATIC RTU3041C

6. Assign a new password.

SIEMENS

7. Navigate to the "System" menu.

User: admin		Syste	m					
	Log out							
. Start page		General	Device info	SD card	System time			
<ul> <li>Start page</li> </ul>								
System					Station name	RTU1		
Diagne		Station description						
Maintenance					Location			
					Latitude	0.000000		
▶ LAN					Longitude	0.000000		
► WAN								
			End session at	iter inactive	period (minutes)	10 🗸		
Services								
Security							Apply	
/ Security								

8. Assign a unique station name.

### SIEMENS SIMATIC RTU3041C

User: admin	Syste	m					
Log out							
	General	Device info	SD card	System time			
<ul> <li>Start page</li> </ul>							
▶ System				Station name	RTU1	~0	
Diagnostics			S	tation description	(	(AI)	
·							
Maintenance				Location			
				Latitude	0.000000		
▶ LAN				Longitude	0.000000		
► WAN							
		End session a	fter inactive	period (minutes)	10 🗸		
<ul> <li>Services</li> </ul>							
▹ Security						Apply	

9. Assign the coordinates for the RTU3041C.

SIEMENS	SIMA	TIC RTU30	41C				
User: admin	Syste	m					
Log out							
	General	Device info	SD card	System time			
<ul> <li>Start page</li> </ul>							
<ul> <li>System</li> </ul>				Station name	RTU1		
▶ Diagnostics			S	tation description			
-							
Maintenance				Location			
				Latitude	0.000000		
▶ LAN				Longitude	0.000000	AI	
► WAN							
		End session a	fter inactive	period (minutes)	10 🗸		
<ul> <li>Services</li> </ul>							
▹ Security						Apply	

10. Then click "Apply".

SIEMENS	SIMA	TIC RTU30	41C				
User: admin	Syste	m					
Log out							
	General	Device info	SD card	System time			
<ul> <li>Start page</li> </ul>							
System				Station name	e RTU1		
▶ Diagnostics			S	tation description	n		
▶ Maintenance				Location			
▶ LAN					e 0.000000		
▶ LAN				Longitud	e 0.000000		
► WAN							
0 mm lana		End session at	fter inactive	period (minutes	) 10 🗸		
<ul> <li>Services</li> </ul>							
▹ Security						Apply	

11. Open the System time tab and select your local time zone.

SIEMENS	SIMATIC RTU3041C	
User: admin Log.out	System	
▶ Start page	General Device info SD card System time	
► System	Local time zone	
▶ Diagnostics		(UTC+01:00) Berlin, Stockholm, Madrid, Kinsl ▼ Manual setting (UTC) London
<ul> <li>Maintenance</li> </ul>	Beginning of daylight saving time	(UTC+01:00) Berlin, Stockholm, Madrid, Kinshasa (UTC+02:00) Athens, Helsinki, Cairo, Johannesburg
→ LAN	End of daylight saving time	UTC+03:00) Moscow, St. Petersburg, Baghdad, Riyadh. (UTC+04:00) Samara, Baku, Abu Dhabi (UTC+05:00) Yekaterinburg, Ashqabat, Karachi
► WAN	Time-of-day synchronization	(UTC-06:00) Hendtumkenty, reingeout, reards in (UTC-06:00) Amaty, Tashkent (UTC-06:00) Amaty, Tashkent (UTC-07:00) Novosibirsk, Bangkok, Jakarta (UTC-08:00) Hutsk, Peking, Manila, Singapore, Perth
<ul> <li>Services</li> </ul>		(UTC+09:00) Seoul, Tokyo
▹ Security	Synchronization method Last time-of-day synchronization (dd:hh:mm:ss) ago	(UTC+10:00) Vladivostok, Sydney (UTC+11:00) Magadan, Solomon Islands (UTC+12:00) Anadyr, Auckland, Wellington (UTC-01:00) Azores, Cape Verde
<ul> <li>Users / groups</li> </ul>	NTP settings	(UTC-02:00) Fernando de Noronha (UTC-03:00) Rio de Janeiro
▸ Operating mode	Interface	(UTC-04:00) Santiago de Chile, Halifax (UTC-05:00) New York
▶ Tags	IP address or DNS name of the NTP server	(UTC-06:00) Mexico City
Expansion card		NOTE: If you want to use time-of-day synchronization through the mobile wireless network,
▶ GPS		check whether this service is supported by your mobile wireless provider.
▶ Program	Diagnostics message	
TeleControl	Reduction factor for communication cycle	Check time-of-day synchronization
▶ Tag tables		Communication cycle: 3 Minutes. Test cycle: 3 Minutes.
		Apply

12. Then click "Apply".

SIEMENS	SIMATIC RTU3041C	
Jser: admin	System	
Log out		
	General Device info SD card System time	
Start page		
System	Local time zone	
Diagnostics		(UTC+01:00) Berlin, Stockholm, Madrid, Kinsl V
		(UTC) London
Maintenance	Decision of devices and so the	(UTC+01:00) Berlin, Stockholm, Madrid, Kinshasa (UTC+02:00) Athens, Helsinki, Cairo, Johannesburg
LAN	Beginning of daylight saving time End of daylight saving time	(UTC+03:00) Moscow, St. Petersburg, Bagndad, Riyadh, Nairobi
	and of daylight saving time	(UTC+05:00) Yekaterinburg, Ashgabat, Karachi (UTC+06:00) Almaty, Tashkent
• WAN	Time-of-day synchronization	(UTC+07:00) Novosibirsk, Bangkok, Jakarta
Services		(UTC+08:00) Irkutsk, Peking, Manila, Singapore, Perth (UTC+09:00) Seoul, Tokyo
	Synchronization method	(UTC+10:00) Vladivostok, Sydney (UTC+11:00) Magadan, Solomon Islands
Security	Last time-of-day synchronization (dd:hh:mm:ss) ago	(UTC+12:00) Anadyr, Auckland, Wellington
Users / groups	NTP settings	
Operating mode	Interface	(UTC-03:00) Rio de Janeiro (UTC-04:00) Santiago de Chile, Halifax
· Operating mode		(UTC-05:00) New York (UTC-06:00) Mexico City
→ Tags	IP address or DNS name of the NTP server	
Expansion card		
Expansion card		NOTE: If you want to use time-of-day synchronization through the mobile wireless network,
GPS		check whether this service is supported by your mobile wireless provider.
Program	Diagnostics message	
		Check time-of-day synchronization
TeleControl	Reduction factor for communication cycle	1 🗸
Tag tables		Communication cycle: 3 Minutes. Test cycle: 3 Minutes.
		Apply

- **Note** If you are running multiple RTUs on a network, you must assign a unique IP address. Assign an IP address according to your network settings (e.g., <u>192.168.0.4</u>).
  - 13. To do this, navigate to the "LAN" menu.

SIEMENS	SIMATIC RTU3041C	
User: admin	LAN	
Log out		
	Overview Configuration	
<ul> <li>Start page</li> </ul>		
▶ System		
► Diagnostics	Control of the external router in the communication mode	
	Activate the LAN interface in communication mode	
Maintenance	Control of external routers Signal unused V	
+ LAN	Lead time (s) 0	
<b>1</b>	Monitoring of external routers Signal unused V	
→ WAN		
<ul> <li>Services</li> </ul>	IP parameter  Specify IP address manually	
	IP address 192.168.0.3	
Security	Subnet mask 255,255,255,0	
<ul> <li>Users / groups</li> </ul>		
	Specify DNS server addresses manually	
<ul> <li>Operating mode</li> </ul>	Preferred DNS server 0.0.0.0	
► Tags	Atternative DNS server 0.0.0.0	
Expansion card	Specify default router manually	
→ GPS	Default router 0.0.0.0	
Program	Z DHCP server active	
▶ TeleControl		
	Apply	
▶ Tag tables		

14. Enter an IP address and subnet mask.

SIEMENS	SIMATIC RTU3041C
User: admin	LAN
Log out	
▶ Start page	Overview Configuration
▶ System	
▶ Diagnostics	Control of the external router in the communication mode
	Activate the LAN interface in communication mode
Maintenance	Control of external routers Signal unused V
▶ LAN	Lead time (s) 0
	Monitoring of external routers Signal unused V
▶ WAN	
Services	IP parameter
7 30171003	Specify IP address manually
Security	IP address 192.168.0.3
Users / groups	Subnet mask 255 255 0
Operating mode	Specify DNS serves sesses manually
	Preferred DNS server 0.0.0.0
▶ Tags	Alternative DNS server 0.0.0.0
Expansion card	Specify default router manually
▶ GPS	Default router 0.0.0.0
▶ Program	DHCP server active
TeleControl	Αρρίγ
Tag tables	

### 15. Then click "Apply".

SIEMENS	SIMATIC RTU3041C
User: admin	LAN
Log out	
Start page	Overview Configuration
F Start page	
▶ System	
► Diagnostics	Control of the external router in the communication mode
7 Diagnostics	Activate the LAN interface in communication mode
Maintenance	Control of external routers Signal unused
▶ LAN	Lead time (s) 0
	Monitoring of external routers Signal unused V
▶ WAN	
Services	IP parameter
	Specify IP address manually
Security	IP address 192.168.0.3
Users / groups	Subnet mask 255.255.255.0
	Specify DNS server addresses manually
<ul> <li>Operating mode</li> </ul>	Preferred DNS server 0.0.0.0
▶ Tags	Alternative DNS server 0.0.0.0
Expansion card	Specify default router manually
▶ GPS	Default router 0.0.0.0
▶ Program	DHCP server active
▶ TeleControl	
	Apply
▶ Tag tables	

### Note

If you have changed the IP address of the RTU3041C, then open the web server of the RTU3041C again in a browser under the new IP address.

- 16. Navigate to the "WAN" menu.
- 17. Open the Mobile wireless settings tab.

SIEMENS	SIMATIC RTU3041C
User: admin	WAN
Log ou	1
. Charlen and a	Overview Mobile wireless settings Wireless cell SMS DynDNS
<ul> <li>Start page</li> </ul>	
▶ System	C Enable mobile wireless interface
Diserseties	
Diagnostics	PIN of the SIM card ····
▶ Maintenance	
	Mobile wireless network parameter assignment
▶ LAN	Selection of the mobile wireless
WAN	Stanuaru
	eDRX interval (s) OFF
Service	PLMN 00000 0 for home PLMN of the SIM card
Security	Allow roaming
Users / groups	Enable data service in the mobile wireless network
Operating mode	APN web.vodafone.de
	User name
▶ Tags	Password
Expansion card	Specify DNS server addresses manually
	Preferred DNS server 0.0.0.0
▶ GPS	Alternative DNS server 0.0.0.0
▶ Program	Enable answers to ping queries
, rogram	
TeleControl	
Tag tables	Notifications
	When changing the IP address No
	Recipient group Administrator SMS 🗸
	Logging
	Signal strength (CSQ / dBm) OFF
	Wireless cell identifier (CI) OFF
	Data sent (kB) OFF
	Data received (kB) OFF
	Apply 22

- 18. Enable the mobile function interface.
- 19. Enter the PIN of the inserted SIM card.
- 20. Enable the mobile data service.
- 21. Enter the APN of your mobile operator. If necessary, enter your username and password.
- 22. Then click "Apply".

### Configuring SMS/email sending/receiving

To enable the RTU3041C to send messages and data for configurable event classes (diagnostic buffer entries), either as SMS or as email to an operator, proceed as follows:

1. Navigate to the "Users / groups" menu.

User: admin	Users / groups					Next communication
Log.out						Next
For the start page → Start	User Recipient groups	_	_	_	_	_
▶ System	Maximum number of users: Name Co	20 mpany/department/position	User name	Phone number	E-mail address	Role
Diagnostics	1 Administrator	npany/departmen/position	admin	+4917xxxxxxxxxxxx	example@gmail.com	Administrator
▶ Maintenance						
▶ LAN						
▶ WAN						
<ul> <li>Services</li> </ul>						
► Security						
Users / groups     Operating m	Add	2 Administrator				
• Tags	Company/department/positi	on				
<ul> <li>Expansion card</li> </ul>		er +4917xxxxxxxxxx				
▶ GPS	Allow receipt of SM messag	Ile Administrator	Ĭ AI			
▶ Program		ss example@gmail.com				
TeleControl		Change login data	(   A   )			
<ul> <li>Tag tables</li> </ul>	User nar Passwo	ne admin				
	Repeat passwo					
		Apply	AI)			

- 2. Add a new user with the name "Administrator".
- 3. Enter the phone number with country code (e.g., "+49" for Germany).
- 4. Enter the email address for the "Administrator" user.
- 5. Then click "Apply".

**Note** The RTU3041C only accepts wake-up SMS messages from phone numbers that are stored here.

6. Open the "Recipient groups" tab.

Users / groups	Add Delete
Operating mo	Change g
	Name Administrator SMS
▶ Tags	Description
Expansion card	Group type SMS
→ GPS	Administrator (+4917xxxxxxxx / example@gmail.com)
▶ Program	Apply
▶ TeleControl	
▶ Tag tables	

- 7. Add a new group named "Administrator SMS".
- 8. Select the type "SMS".
- 9. Enable the "Administrator" user.
- 10. Then click "Apply".

- 11. Add a new group named "Administrator Email".
- 12. Select the "Email" type.
- 13. Enable the "Administrator" user.

► Users / groups	Add	Delete	
▶ Operating mode	Change group data		
Taga	Name	Administrator SMS	
▶ Tags	Description		( )
Expansion card	Group type	E-mail	
▶ GP\$	Administrator (+4917xxxxxx	xxxx / example@gmail.com)	AI
▶ Program	Apply		
▶ TeleControl			
▶ Tag tables			

- 14. Then click "Apply".
- 15. Navigate to the "WAN" menu.
- 16. Open the "SMS" tab.

SIEMENS SIMATIC RTU3041C

User: admin	WAN
Log out	
	Overview Mobile wireless settings Wireless cell SMS DynDNS
▶ Start page	
▶ System	Allow receipt of SMS messages
▶ Diagnostics	
▶ Maintenance	Acknowledgment of wake-up Sh
▶ maintenance	Additional communication cycle at a
► LAN	number of bulleted Sivis messages
WAN	Apply (M)

- 17. Enable the "Allow receipt of SMS messages" checkbox.
- 18. Enable the "Acknowledgment of wake-up SMS message" checkbox.
- 19. Then click "Apply".

- 20. Navigate to the "Services" menu.
- 21. Open the "E-mail" tab.

SIEMENS	SIMATIC RTU3041C		
	_		
User: admin	Services		
Log out			
▶ Start page	Overview E-mail FTP		
▶ System		Active	
Diagnostics	SMTP server name		
	Port number	<u> </u>	
▶ Maintenance	Interface		~
▶ LAN		STARTTLS, if possible.	~
F LAN	Own e-mail address		23
► WAN	User name	AL	)
	Password		
Services	CA certificate		
Security	Currently used file		Delete
	File used after applying		
Users / groups	Load new file	No file selected	Search
Operating mode		Load on device	
▶ Tags		Encrypt zipped attachments	
	Password		
Expansion card			
▶ GPS	Additional communication cycle at a number of buffered e-mails	8	
▶ Program		Apply 2	
TeleControl		( 🍋 )	

- 22. Enable the "Active" option there.
- 23. Enter the server data of the email account that the RTU3041C should use to send emails.
- 24. Then click "Apply".

### **Configuring operating modes**

To conserve power, the RTU3041C is in sleep mode much of the time, switching to an update or communication mode in predetermined cycles.

1. Navigate to the "Operating mode" menu.

ser: admin	Operating mode			
Log out				
Start page	Operating modes Logging	Power supply	Battery lifeti	ime
Start page				
System		Update m	ode	
Diagnostics			cle 1 hour	×2
		e of the update c		
Maintenance		y of the update c		
LAN	Add	itional update cy		~
LAN				y tag, you can set an individual update cycle with a
WAN			reductio	n factor.
Services	Co	mmunication m	ode	
	С	ommunication m	ode Cyclic	
Security		Basic c	cle 12 hours	s ( 🌇 🔭
Users / groups	Start time of the o	communication cy	rcle 00:00:00	
	Start day of the o	communication cy	cle Monday	×
Oper, sing mode		Minimum dura	tion No	*
Tags				
				Start test communication mode
Expansion card				
GPS	Turn on mobile wireless int	Sleep me		
	Turn on mobile wireless int check for receip	ot of SMS messa	je? No	Ň
Program	Start tir	me of checking c	cle 00:00:00	
TeleControl				
		Service m		
Tag tables		Minimum dura	tion 30 seco	nds
				Apply

- 2. Enter the cycle of the update mode e.g., "1 minute" for test purposes or choose"1 hour" for the application described here.
- 3. Set the communication mode to "Cyclic" and specify the cycle of the communication mode e.g., "10 minutes" for test purposes or "12 hours" for the application described here.
- Enter how often the mobile wireless interface should be switched on to fetch SMS. This is not necessary for the application described here. Select "No" for this purpose
- 5. Enter the minimum duration of the service mode e.g., "always" for test purposes or "30 seconds" for the application described here.
- **Note** The RTU3041C dials into the mobile wireless network every 12 hours. If the RTU3041C dials into the mobile wireless network more frequently, the power consumption will increase.
  - 6. Then click "Apply".

### Configuring the GPS functionality of the RTU3041C

To enable communication between the RTU3041C and its communication partner via GPS, proceed as follows:

- 1. Navigate to the "GPS" menu.
- 2. Open the "General" tab.

SIEMENS	SIMATIC RTU3041C
User: admin	GPS
Log out	
▶ Start page	General Tags
▶ System	Active
▶ Diagnostics	Update cycle Reduction factor for basic cycle 1
▶ Maintenance	Update cycle of this input - Basic cycle: 1 Hours. - Cycle of the input: 1 Hours.
► LAN	GPS always active
► WAN	Power GPS via batte     of external power failure
▹ Services	Apply
▹ Security	
Users / groups	
▶ Operating mode	
▶ Tags	
Expansion card	
+ GPS	
Prog     TeleControl	
Tag tables	
rug tables	

- 3. Enable the "Active" checkbox.
- 4. Select the "GPS always active" check box.
- 5. Then click "Apply".

To enable the time synchronization via GPS, proceed as follows:

- 6. Navigate to the "System" menu.
- 7. Open the "System time" tab.

SIEMENS	SIMATIC RTU3041C	
User: admin	System	
Logout		
▶ Start page	General Device info SD card System time	
► System	Local time zone	
		(UTC+01:00) Berlin, Stockholm, Madrid, Kinsl 🗸
Diagne		+ 🗸 01 🗸 h 00 🗸 min
Maintenance		Automatic daylight saving time switch
	Beginning of daylight saving time	e Last 🗸 Sunday 🗸 March 🗸 02 🗸 h 00 🗸 min
▶ LAN	End of daylight saving time	e Last 🗸 Sunday 🗸 October 🗸 03 🗸 h 00 🗸 min
▶ WAN		
Services	Time-of-day synchronization	n 🔽 Active 🔪
F Services	Synchronization method	
▶ Security	Last time-of-day synchronization (dd:hh:mm:ss)	
► Users / groups	ago	
r oscisi groups	NTP settings	
<ul> <li>Operating mode</li> </ul>	interface	Accept time-of-day from non-synchronized NTP servers
▶ Tags	IP address or DNS name of the NTP server	
Expansion card		NOTE:
▶ GPS		If you want to use time-of-day synchronization through the mobile wireless network, check whether this service is supported by your mobile wireless provider.
▶ Program	Diagnostics message	
▶ TeleControl		Check time-of-day synchronization
	Reduction factor for communication cycle	communication cycle: 3 Minutes.
▶ Tag tables		Test cycle: 3 Minutes.
		Apply
		$\langle \mathfrak{S} \rangle$

- 8. Enable the time synchronization.
- 9. Select "GPS" as the synchronization method.
- 10. Then click "Apply".

In order to send the determined GPS position of the RTU3041C to the TeleControl Server Basic (TCSB), and to read it out via the OPC UA Client, enable the GPS tags:

- 11. Navigate to the "GPS" menu.
- 12. Open the "Tags" tab.

SIEMENS	SIMATIC RTU3041C	
User: admin	GPS	
Log out		
	General Tags	
<ul> <li>Start page</li> </ul>		Lessies
▶ System	Active Type Name 0 No Latitude	Logging OFF
> system		OFF
▶ Diagnostics	1 No 2 No (m)	OFF
v Diagnostics	3 No satellites	OFF
Maintenance	4 No Time of last position	OFF
► LAN	Z Active	
▶ WAN	Type Latitude	
	Name gpsLatitude	
▶ Services		
	Current value - (AI) Read	
▹ Security	Logging	
	Current value OFF V	
<ul> <li>Users / groups</li> </ul>		
Operating mode	Apply	
v operading mode		
▶ Tags		
Expansion card		
+ GPS		
Progra		
TeleControl		
▶ Tag tables		

- 13. Click the "Latitude" tag.
- 14. Enable the "Active" checkbox.
- 15. Enter a name for the desired tag.
- 16. Then click "Apply".
- 17. Repeat steps 9-12 for the tags "Longitude", "Visible satellites", and "Time of last position".

GPS	3				
Genera	al Tags				
	Active	Type	Name	Logging	
0	Yes	Latitude	gpsLatitude	OFF	
1	Yes	Longitude	gpsLongitude	OFF	
2	No	Altitude (m)		OFF	
3	Yes	Visible satellites	visibleSatellites	OFF	
4	Yes	Time of last position	timeLastPosition	OFF	

### Creating tags for programming in the RTU3041C

Before you start programming in the RTU, configure the inputs, outputs, and memory bits.

- 1. Navigate to the "Tags" menu.
- 2. Open the "Digital inputs" tab.

SIEMENS	SIMATIC RTU3041C								
User: admin	Tags						Next comm	nunication r	mode (c
Log.out								Next SM	IS check
<ul> <li>Start page</li> </ul>	Overview Digital i puts Digital outp	puts Digital memory bits	Analog inputs	Analog memory b	its Temperatu	re (internal)	Power supply (external)	Battery	Texts
	Active N	Туре	Text for ON / Un	it Text for	OFF / Format	Update (	cycle	Logging	
▶ System		Digital input	1	0			/ Yes, also in sleep mode	OFF	
		Digital input	1	0			/ Yes, also in sleep mode	OFF	
<ul> <li>Diagnostics</li> </ul>		Digital input				1 Hours		OFF	
		Digital input				1 Hours		OFF	
Maintenance		Digital input				1 Hours		OFF	
	5 No	Digital input				1 Hours		OFF	
→ LAN		Active	•						
→ WAN	Nam	e float	۲						
Services	Тур	e Digita		*					
,	Current valu		Read						
<ul> <li>Security</li> </ul>	Update cycl	le 🚽							
Liere (groupe	Reduction factor for basic cycl								
<ul> <li>Users / groups</li> </ul>	Update cycle of this inpu	<ul> <li>Basic cycle: 1 Hours.</li> <li>Cycle of the input: 1 Ho</li> </ul>	iurs.						
<ul> <li>Operating mode</li> </ul>	Additional update cycle on value chang	e Yes, also in sleep mode	~	-					
	Forma	at		6					
> Tag	Text for O	N 4		) //					
	Text for OF								
+ Exp	Loggin								
▶ GPS	Current valu		~						
▶ Program									
* Frogram		Apply							
TeleControl									
► Tag tables									
			$\mathbf{i}$						

- 3. Click on input 0.
- 4. Enable the "Active" checkbox.
- 5. Assign the name "float".
- 6. Select that an additional update cycle is also performed in sleep mode when the value changes.
- 7. Then click "Apply".
- 8. Click on input 1.
- 9. Enable the "Active" checkbox.
- 10. Assign the name "enableReadFillLevel".

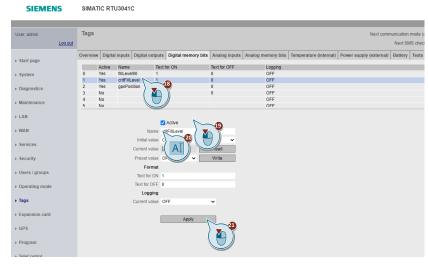
SIEMENS SIMATIC RTU3041C

		-	_	-	_		-			
User: admin	Tags								Next comm	
Log out										Next SM:
	Overview Digital inputs	Digital outputs	Digital memory bits	Analog inputs	Analog memor	ory bits	Temperature	(internal)	Power supply (external)	Battery
<ul> <li>Start page</li> </ul>	Active Name	Туре		Text for ON / Unit	Taut	t for OFF	Earmat	Update c	uala	Logging
▶ System	0 Yes float	Digital		1	0		Format		Yes, also in sleep mode	OFF
▶ System	1 Yes enableR			1	0				Yes, also in sleep mode	OFF
<ul> <li>Diagnostics</li> </ul>	2 No	- Digital	linput					1 Hours		OFF
, progression	3 No	Digital						1 Hours		OFF
► Maintenance	4 No	Digital						1 Hours		OFF
	5 N0	Dinita	Linout					1 Hours		OFF
▶ LAN										
		<b>Z</b> .	Active							
▶ WAN		Name en	ableRea 🗸 💙							
		Type Dig	nital inpu 🌔 💾 🌒	M	<b>M</b>					
<ul> <li>Services</li> </ul>		Current value		Read A Ĭ	<b>*</b>					
		_		Kead AI	))					
▶ Security	U	Ipdate cycle								
	Reduction factor for	or basic cycle 1	*	<u> </u>						
<ul> <li>Users / groups</li> </ul>	Update cycle	e of this input - B	asic cycle: 1 Hours. cycle of the input: 1 Hou	irs.						
<ul> <li>Operating mode</li> </ul>	Additional update cycle on v	alue change Ye	s, also in sleep mode	N	_					
		Format								
Tags		Text for ON 1		( 👔						
Expansion card		Text for OFF 0								
r expansion card		Logging								
+ GPS		Current value OF								
	(	Surrent value OF		~						
▶ Program										
TeleControl			Apply							
▶ Tag tables										

- 11. Select that an additional update cycle is also performed in sleep mode when the value changes.
- 12. Then click "Apply".
- 13. Open the "Digital memory bits" tab.

SIEMENS	SIMATIC RTU3041C
User: admin	Tags Next communication mode (cy
Log.out	Next SMS check i
Start page	Overview Digital inputs Digital outputs Digital norv bits Analog inputs Analog memory bits Temperature (internal) Power supply (external) Battery Texts
▹ System	Active Name Text for ON FExt for OFF Logging OFF
	1 Yes critFilLevel 0 OFF 2 Yes gpsPosition 0 OFF
<ul> <li>Diagnostics</li> </ul>	3 No 0FF
Maintenance	4 No OFF 5 No OFF
► LAN	Z Active
► WAN	Name fill eveloo
<ul> <li>Services</li> </ul>	Initial value OFF
<ul> <li>Security</li> </ul>	Preset value OFF Write
▶ Users / groups	Format
v Gaera / groups	Text for ON 1
<ul> <li>Operating mode</li> </ul>	Text for OFF 0 Logging
▶ Tags	Current value OFF
Expansion card	Apply
▶ GPS	
▶ Program	
▶ TeleControl	

- 14. Click on the 0 memory bit.
- 15. Enable the "Active" checkbox.
- 16. Assign the name "fillLevel90".
- 17. Then click "Apply".
- 18. Click memory bit 1.
- 19. Enable the "Active" checkbox.
- 20. Assign the name "critFillLevel".



21. Then click "Apply".

- 22. Click memory bit 2.
- 23. Enable the "Active" checkbox.
- 24. Assign the name "gpsPosition".

SIEMENS	SIMAT	IC RT	J3041	С									
User: admin	Tags										Next comm	nunication	mode (e
Log.out												Next SM	IS chec
	Overview	Digital	l inputs	Digital outp	outs	Digital memory bits	Analog inputs	Analog me	emory bits	Temperature (internal)	Power supply (external)	Battery	Texts
▶ Start page		Active	Name		Text for	r ON	Text for OFF		Logging				
▶ System		Yes	filLeve		1		0		OFF				
* system		Yes	critFill		1		0		OFF				
▶ Diagnostics	2	Yes	gpsPo	sition N	1		0		OFF				
<ul> <li>Diagnostics</li> </ul>	3	No		$\sim$	-0	2	0		OFF				
	4	No		- ( N		lí l			OFF				
Maintenance	5	No			Ч,	)			OFF				
→ LAN					J								
						ictive	-AB						
► WAN				Nam	e gir	Position							
				Initial valu	e OF	- 24	<b>~</b>						
▶ Services				Current valu	. =(	AI 🖂	Read						
<ul> <li>Security</li> </ul>				Preset valu	e OFI	¢	Write						
				Forma	it								
<ul> <li>Users / groups</li> </ul>				Text for Of	N 1								
				Text for OF	E O								
<ul> <li>Operating mode</li> </ul>													
				Loggin	-								
Tags				Current valu	e OFI	F	~						
Expansion card						Apply	-49						
> GPS							$\Theta$						

- 25. Then click "Apply".
- 26. Open the "Analog inputs" tab.

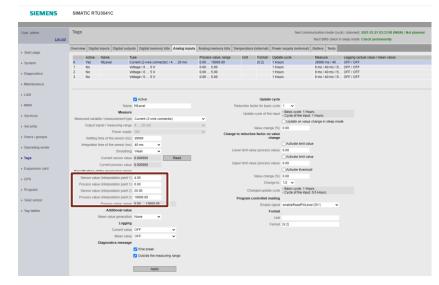
SIEMENS	SIMATIC RTU3041C									
User: admin	Tags	_		_			-	Next comm	unication mode (cyc	iic / planned): 2021-03-21 03:33:00 (WAN) / Not planne
Log.out									Next SMS check in	n sleep mode: Check permanently
	Overview Digital inputs Digital output	ts Digital memory bits	Analog inputs	Analog memory bits	Temperature	(internal)	Power	supply (external)	Battery Texts	
<ul> <li>Start page</li> <li>System</li> </ul>		pe 27 2-wire connector) /	4 20	26 s value, range 10000.00	Unit	Format [V.2]	Update 1 Hour 1 Hour	5	Measure 30000 ms / 40 0 ms / 40 ms / 5	Logging (actual value / mean value) DFF / OFF DFF / OFF
Diagnostics     Maintenance	2 No 3 No	/05V /05V	C	5.00			1 Hour 1 Hour	5	0 ms / 40 ms / S. 0 ms / 40 ms / S.	OFF/OFF
<ul> <li>Maintenance</li> </ul>										
→ LAN		Active				Update	e cucle			
▶ WAN	Name	fiLevel	-49		Reduction fai			1 ¥		
Services	Measure Measured variable / measurement troe	29	) J	~	Update	cycle of th		- Basic cycle: 1 Hour - Cycle of the input:		
Security	Output signal / measuring range			¥		Value chan		Update on value on	mange in sleep mot	0e
Users / groups	Power supply			~ Chan	ge to reductio	n factor or	value			
r oaera r groupa	Settling time of the sensor (ms) Integration time of the sensor (ms)					· · ·	:hange	Activate limit valu		
<ul> <li>Operating mode</li> </ul>	Smoothing				Lower limit val	Je (process	(euley	0.00		
• Tags	Current sensor value	0.000000	Read					Activate limit valu		
	Current process value	0.000000			Upper limit vah	ue (process				
<ul> <li>Expansion card</li> </ul>	Specification of the measuring range							Activate threshold		
GPS	Sensor value (interpolation point 1)					Value chan				
Program	Process value (interpolation point 1)						inge to:		4.	
Program	Sensor value (interpolation point 2) Process value (interpolation point 2)					nged updati		Basic cycle: 1 Hour     Cycle of the input:	0.5 Hours.	
TeleControl	Process value (interpolation point 2) Process value, range				Program-c		-			
Tag tables		0.00					Format	enableReadFilLeve	(DI1) ¥	
<ul> <li>ray tables</li> </ul>	Mean value generation	None Y					Unit			
	Logging						Format	DV 21		
	Current value	OFF	~				- onnon	(***)		
	Mean value	OFF	~							
	Diagnostics message									
		🛃 Wire break								
		Outside the measuring	range							

- 27. Click the analog input 0.
- 28. Enable the "Active" checkbox.
- 29. Assign the name "fillLevel".

30. Select the measurement type of your analog level sensor. The SITRANS Probe LU150 sensor must be set to "Current (2-wire connector)".



- 31. Enter the settling and integration time as well as the smoothing of the signal of your sensor. The following settings are recommended for the SITRANS Probe LU150 sensor:
  - Settling time: 30,000 ms
  - Integration time: 40 ms
  - Smoothing: Weak
- **Note** Note that (settling time + integration time) \* smoothing factor must not be longer than the update mode cycle.
  - 32. Enter the sensor and process values for your application. In this application example, a sensor signal of 20 mA corresponds to a level of 10,000 m<sup>3</sup>.



33. Select the digital input "enableReadFillLevel (DI1)" as the "enable signal".

SIEMENS	SIMAT	IC RTU	J3041C	_	_				_									
ser: admin	Tags												Next comm	unicat	ion mode (cyc	šc / planned): 2021	-03-21 03:33:00 (WAN)	/ Not pla
Loo.out														Next	SMS check is	sleep mode: Chec	ck permanently	
	Overview	Digital	inputs Digital ou	tputs Digital	memory bits	Analog inputs	Analo	g memory bits	Temperat	ure (in	ternal)	Power	r supply (external)	Batte	ry Texts			
Start page	_	Active	Name	Type			Droce	iss value, range	Unit	_	Format	Hotal	in costin	Max	Isure	Longing (actually	value / mean value)	
System		Yes	filLevel		e connector) /	420 mA		10000.00	UHI			1 Hou				OFF / OFF	ranue / mikem varue)	
		No		Voltage / 0				5.00				1 Hou			s / 40 ms / S.			
Diagnostics		No		Voltage / 0				5.00				1 Hou			s / 40 ms / S.			
	3	No		Voltage / 0	5 V		0.00	5.00				1 Hou	115	0 m	s / 40 ms / S.	. OFF / OFF		
Maintenance																		
AN				-														
WAN				Active					_		Update							
WAN				me fillevel					Reduction									
Services			Measu						Up	date cy	cle of thi	is input	- Basic cycle: 1 Hour - Cycle of the input:	rs. 1 Hou	rs.			
			ile / measurement ty			w)	~						Update on value of			5e		
Security		Output sig	pnal / measuring ran	ge 4 20 m	4		$\sim$			Va	lue chan	09 (56)	0.00					
			Power sup	ply ON			~	Char	ge to redu									
Users / groups		Setting t	time of the sensor (in	ns) 30000							c	hange						
Operating mode	Int	egration ti	time of the sensor (in	ns) 40 ms	~								Activate limit valu	e				
operating mode			Smooth	ing Weak	~				Lower limit	value (	(process	value)	0.00					
Tags			Current sensor val	ue 0.000000		Read							Activate limit value	0				
			Current process val	0.000000	_				Upper limit	value	(process	value)	0.00					
Expansion card	Specific		the measuring ran										Activate threshold					
			e (interpolation point							Va	lue chan	ge (%)	0.00					
GP\$			e (interpolation point e (interpolation point										1/2 ¥					
Program			e (interpolation point e (interpolation point										- Basic cycle: 1 Hour - Cycle of the input	rs.				
rogan													- Cycle of the input:	0.5 H	ours.			
TeleControl	Proc		e (interpolation point						Progra	n-cont	trolled re	ading						
			Process value, ran		000.00						Enable	signal	enableReadFilLeve	(DI1)	~			
Tag tables			Additional val								F	ormat				9		
		1	Mean value generat	ion None	~							Unit						
			Loggi	ng								Format	[V.2]		-			
			Current val	ue OFF		¥												
			Mean va	ue OFF		~										$\sim$		
		0	Diagnostics messa	œ														
				Vire br	nak.		4											
				Outside	the measuring		R.											
							1											
				_	ADDIY	$\langle \mathbf{U} \rangle$	//											
					1 1000	B												
					$\rightarrow$	V V												
					(													
					1													

- **Note** This setting means that the analog input "fillLevel" is only read if the digital input "enableReadFillLevel" is activated. This can significantly reduce power consumption.
  - 34. Enable the "Diagnostics messages" to diagnose the errors.
  - 35. Then click "Apply".
  - 36. Open the "Analog memory bits" tab.
  - 37. Click the analog memory bit 0.
  - 38. Enable the "Active" checkbox.
  - 39. Assign the name "maxVolume".

	User: admin		Tags										Nex	t comm	unication	mode (cycl
		Log out													Next SM	IS check in
П			Overview	v Digital	inputs Dig	gital outputs	Digital memory	bits /	Analog inputs	Analog memory b	its Temper	ature (internal)	Power supply (ext	ernal)	Battery	Texts
)	<ul> <li>Start page</li> </ul>		_							1	- eli					_
	System		0		Name maxVolume	Type Inc value		Unit Liter		Format [V.2]	· 🖍 🐧	OFF				
Ľ	system		1	Yes	filLevelPe.		<b>U</b>	%		[V.2]		OFF				
,	Diagnostics		2		distance	- ( 陷				[V.2]		OFF				
			3	No No		Ana				[V.2]		OFF				
	Maintenance		4	NO		Counter	19			[V.2]		OFF				
	LAN						Active	7								
,	WAN					Name m		$\rightarrow$	<b>5</b>							
							halog vetue	-	<b>3</b>							
)	Services				Ir	nitial value 10		3 <b>8</b> 1								
						rent value 10		TI	ad							
1	Security					eset value	(AI)	M	Write							
,	Users / groups				Pf			<u> </u>	vvrite							
						Format										
)	Operating mode					Unit Lit										
						Format [V.	2]									
1	Tags					Logging										
	Expansion card				Cur	rent value O	FF	`	·							
)	GPS						Apply	1								
	D							$\rangle$	<b>x Y</b>							
2	Program															
	TeleControl															
	Tag tables															

- 40. Select the type "Analog value".
- 41. Enter the maximum fill level of the rainwater overflow tank in cubic meters (m<sup>3</sup>) as the initial value.
- 42. Then click "Apply".
- 43. Click the analog memory bit 1.

- 44. Enable the "Active" checkbox.
- 45. Assign the name "fillLevelPercent".
- 46. Select the type "Analog value".

SIEMENS	SIMATIC RT	U3041C				
User: admin	Tags					
Log out						
	Overview Digita	l inputs Digital outp	Its Digital memory bits	Analog inputs	Analog memory bits	Temperature (internal) P
<ul> <li>Start page</li> </ul>	Active	Name Type	Unit		Format	Logging
▶ System	0 Yes	maxVolume Analog			[V.2]	OFF
y system	1 Yes	ULevelPe Analog			[V.2]	OFF
▶ Diagnostics	2 Yes	c 43 Analog	value		[V.2]	OFF
V Diagnosues	3 No	Analog	value		[V.2]	OFF
▶ Maintenance	4 No	Analog	value		[V.2]	OFF
Maintenance	5 No	Counte	r			OFF
► LAN			Active	<b>1</b>		
► WAN			fillLevel orcent	( 🍋 )		
▹ Services		Type Initial value	Analog Al			
Security		Current value		Read		
		Preset value		Write		
<ul> <li>Users / groups</li> </ul>		Format				
		Unit	96			
<ul> <li>Operating mode</li> </ul>						
		Format	[V.2]			
▶ Tags		Logging				
▶ Expansion card		Current value	OFF	*		
▶ GPS			Apply	47		
▶ Program				Ð		

- 47. Then click "Apply".
- 48. Click on the analog memory bit 2.
- 49. Enable the "Active" checkbox.
- 50. Assign the name "distance".

51. Select the type "Analog value".

SIEMENS	SIMAT		J3041	с						
User: admin	Tags									
Log out										
	Overview	Digital	inputs	Digit	al output	s Digital memor	y bits	Analog inputs	Analog memory bits	Tempera
<ul> <li>Start page</li> </ul>					-	1				
		Active	Name		Туре	-1	Unit Liter		Format	
<ul> <li>System</li> </ul>		Yes Yes			Analog v Analog v		Liter %		[V.2] [V.2]	
		Yes	distand		Analog v Analog v		70		[V.2]	
<ul> <li>Diagnostics</li> </ul>		No	uistant		analog v Bg v	alue			[V.2]	
		No			a bg v				[V.2]	
Maintenance	5	No			hter					
► LAN						Active	•			
► WAN					Name					
▹ Services				Initi	Type al value	Analog / AT	J	~		
▹ Security				Curre	nt value	0.000		Read		
► Users / groups					et value			Write		
					Format					
Operating mode					Unit					
					Format	[V.2]				
▶ Tags				L	ogging					
► Expansion card				Curre	nt value	OFF		*		
▶ GPS					[	Apply		2		
▶ Program							U			
▶ TeleControl										

52. Then click "Apply".

### Configuring texts for SMS/email dispatch

1. Open the "Texts" tab.

User: admin Log.out	Tags							Next com	nunication mode (cy Next SMS check i
Start page	Overview	Digital inputs	Digital outputs	Digital memory bits	Analog inputs	Analog memory bits	Temperature (internal)	Power supply (external)	Battery Texts
		Name		,	lext				
System	1								(
Diagnostics	2								
	3 4								
Maintenance	5								
LAN	N	Add	D	elete					
		-0							
• WAN		Mange Inge		7					
Services			ame cntLevelRea		2				
Security		<u> </u>		evel of the rain critical level.	Al )^ '	it station x has	•		
security			Text Date: [DAT				20		
Users / groups			Time: [TIM	e]	<u> </u>	( A			
Operating mode		Number of charac	tors 110						
· Operating mode				oply					
Tags			NOTE:		2				
Expansion card			Maximum ler If the maxim	ngth per um chara	characters exceeded, with SI	VS the text is sent in 2 r	nessages		
Copulation said			When config	uring the terms of 6	placeholders can	be configured per text b	lock for		
• GPS			process and	system tags.		values before the mes			
Program			Note that wh	en replacing the place an be exceeded.	holders with the pr	ocess values, the text le	ength of 160		
, rogram									
TeleControl				8, 8, 0, U, A, O, U					
Tao tables				~/;<=>?@\$&&_;					
				kets [] are reserved fo					
			- [V] or [V.x]		values, the follow	ring formats are permitte	id:		
			V = tag nan	no r of decimal places (re	niace y with a dial				
			•[DATE]	e with format yyyy-mm		9			
			- [TIME]						
			- [V.T]	e with format hhomes					
			Duration wi - (V.T2)	th format hhihimmiss	(resolution: secon	nds)			
				th format: hhihi:mm:ss	ss (resolution: hu	ndredth of seconds)			
			station nam	-1 IE					
				device manual to learn					

- 2. Add a new text to be sent via SMS and email when the critical level is exceeded:
  - Name: critLevelReached
  - Text: The fill level of the rain overflow basin at station x has reached a critical level.

- Date: [DATE]
- Time: [TIME]
- 3. Then click "Apply".
- 4. Add a new text to be sent when the critical level is exceeded in the subject of the email:
  - Name: subCritLevelReached
  - Text: Critical fill level reached at station x

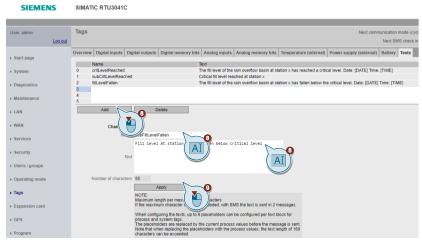
SIEMENS	SIMATIC RTU3041C
User: admin	Tags Next communication mode (cyclic / j
Log.out	Next SMS check in slev
▶ Start page	Overview Digital inputs Digital outputs Digital memory bits Analog inputs Analog inputs Analog memory bits Temperature (internal) Power supply (external) Battery Texts
▶ Start page	Name Text
▶ System	o crifLevelReached The fill level of the rain overflow basin at station x has reached a critical level. Date: [DATE] Time: [TIME]
	2
<ul> <li>Diagnostics</li> </ul>	3
▶ Maintenance	4
▶ LAN	Add Delete
➤ WAN	
<ul> <li>Services</li> </ul>	Critical fill level reached
▶ Security	Text
▶ Users / groups	
<ul> <li>Operating mode</li> </ul>	Number of characters 40
+ Tags	Apply NOTE:
Expansion card	Maximum length per m Caracters in the maximum characters in the maximu
▶ GPS	When configuring the tage shades can be configured per text block for process and system tags and the current process values before the message is sent.
▶ Program	Note that when replacing the placeholders with the process values, the text length of 160 characters can be exceeded.

- 5. Then click "Apply".
- 6. Add a new text to be sent by SMS and email when the level falls below the critical level:

SIEMENS	SIMATIC RTU3041C
User: admin	Tags Next communication mode (cyc
Log out	Next SMS check in
Start page	Overview Digital inputs Digital outputs Digital memory bits Analog inputs Analog memory bits Temperature (internal) Power supply (external) Battery Texts
<ul> <li>start page</li> </ul>	Name Text
▹ System	0 critLevelReached The fill level of the rain overflow basin at station x has reached a critical level. Date: [DATE] Time: [TIME]
	1 subCritLevelReached Critical fill level reached at station x 2
<ul> <li>Diagnostics</li> </ul>	3
▶ Maintenance	4 5
► LAN	Add Delete
<ul> <li>Services</li> </ul>	Nome ful_avelFalen The fill level of the rain g (in at station x has
<ul> <li>Security</li> </ul>	fallen below the critical 1
▶ Users / groups	
<ul> <li>Operating mode</li> </ul>	Number of characters 117
▶ Tags	NOTE: Maximum length per mer/
Expansion card	if the maximum characte( 🎽 )eeded, with SMS the text is sent in 2 messages.
▶ GPS	When configuring the text process and system lag. The picceholders are replaced by the current process values before the message is sent. Note that when replacing the picceholders with process values, best length of 100

- Name: fillLevelFallen
- Text: The fill level of the rain overflow basin at station x has fallen below the critical level.
- Date: [DATE]
- Time: [TIME]
- 7. Then click "Apply".

- 8. Add a new text to be sent when the level falls below the critical level in the subject of the email:
  - Name: subFillLevelFallen
  - Text: Fill level at station x has fallen below critical level



- 9. Then click "Apply".
- 10. Add a new text to be sent by SMS when the RTU3041C moves within a parameterized radius:

SIEMENS	SIMATIC RTU3041C
User: admin	Tags Next communication mode (cy
Log.out	Next SMS check:
	Overview Digital inputs Digital outputs Digital memory bits Analog inputs Analog memory bits Temperature (internal) Power supply (external) Battery Texts
<ul> <li>Start page</li> </ul>	Name Text
⊁ System	0 critt_evelReached     The fill level of the rain overflow basin at station x has reached a critical level. Date: [DATE] Time: [TIME]
· Jyacan	1 subCritLevelReached Critical fill level reached at station x
<ul> <li>Diagnostics</li> </ul>	2 fill_evelFallen The fill level of the rain overflow basin at station x has fallen below the critical level. Date: [DATE] Time: [TIME]
Diagnostics	3 subFill_evelFallen Fill level at station x has fallen below critical level
Maintenance	4 5
> LAN	Add Delete
> WAN	cr posterotk
<ul> <li>Services</li> </ul>	The last known GPS po
<ul> <li>Security</li> </ul>	radius. Text Date: [DATE]
<ul> <li>Users / groups</li> </ul>	Time: [TINE]
<ul> <li>Operating mode</li> </ul>	Number of characters 85
▶ Tags	Apply NOTE:
Expansion card	Maximum length per my If the maximum charac
▶ GPS	When configuring the texture placeholders can be configured per text block for process and system tags. The placeholders are replaced by the current process values before the message is sent.
Program	Note that when replacing the placeholders with the process values, the text length of 160 characters can be exceeded.

- Name: gpsPositionOK
- Text: The last known GPS position is within the tolerance radius.
- Date: [DATE]
- Time: [TIME]
- 11. Then click "Apply".

12. Add a new text to be sent by SMS when the RTU3041C moves outside a parameterized radius:

SIEMENS	SIMATIC RTU3041C
User: admin	Tags Next communication mode (cyc at Next SMS check in
→ Start page	Overview         Digital inputs         Digital outputs         Digital memory bits         Analog inputs         Analog memory bits         Temperature (internal)         Power supply (external)         Battery         Texts
F Start page	Name Text U Unit ventreaureu Tier in even us ne taer veel nur uaan at sanut A has teaureu a Unitae even uare. UATE Leine, i tiwe i
→ System	concerence automotion     concerence     co
► Diagnostics	2 fill.evelFallen The fill level of the rain overflow basin at station x has fallen below the critical level. Date: [DATE] Time: [TIME] 3 subFill.evelFallen Fill level at station x has fallen below critical level
	4 gpsPositionOK The last known OPS position is within the tolerance radius. Date: [DATE] Time: [TIME]
Maintenance	5
+ LAN	Add Delete
→ WAN	
<ul> <li>Services</li> </ul>	The last known GPS post A T tride the tolerance
▹ Security	redius. Text Date: [DATE]
<ul> <li>Users / groups</li> </ul>	
<ul> <li>Operating mode</li> </ul>	Number of characters 86
→ Tags	Apply NOTE: Moximum length pu
Expansion card	If the maximum cha exceeded, with SMS the text is sent in 2 messages.
▶ GPS	When configuring the 6 placeholders can be configured per text block for process and system tags. The placeholders are reduced by the current process values before the message is sent.
▶ Program	Note that when replacing the placeholders with the process values, the text length of 160 characters can be exceeded.

- Name: gpsPositionNotOK
- Text: The last known GPS position is outside the tolerance radius.
- Date: [DATE]
- Time: [TIME]
- 13. Then click "Apply".

### Creating a program in the SIMATIC RTU3041C

In order for the RTU3041C to respond appropriately to events, you must create a program. Programming is comparable to "FBD" in the TIA Portal.

### Program comparison of the current level with a critical value

- 1. Navigate to the "Program" menu.
- 2. Assign the name "Critical fill level" to the network.
- 3. Add a new function block (FB1).

Network 1	
Name Critical fill level	ы кы
Comment Determine if a critical fill lev	

- 4. Select "Division" as the function.
- 5. Interconnect the parameters as follows:
  - Dividend: fillLevel (AI0)
  - Divisor: maxVolume (AM0)
  - Quotient: fillLevelPercent (AM1)

Critical fill l	evel	
Name	Critical fill level	Ku ta
Comment	Determine if a critical fill level is reached	
FB1 Com	ment Calculate the fill level in percent	
	Division	
True		Quoti
fillLevel		Error Unused
maxVolu	ume (AMI	

6. Add a new function block (FB2) below it.

Critical fill le	evel				
Nama	Oritical fill have				
	Critical fill level				Кя <sup>К</sup> я
Comment	Determine if a critical f	ill level is reached			
FB1 Com	ment Calculate the fill			_	*
		Division		<u>~</u>	
True	✓————————————————————————————————————	En	Quotie	nt fillLeve	elPercent (/ 🔽 📩
fillLevel	(AI0)	Dividend	Err	or O-Unuse	d 🔽 🗙 🖌
maxVolu	ume (AMI	Divisor			
					*
					( 🕘 )

- 7. Select "Limit value switch" as the function.
- 8. Interconnect the parameters as follows:
  - Input: fillLevelPercent (AM1)
  - Output: fillLevel90 (DM0)
  - Limit value 1: 0.9000
  - Limit value 2: 0.8999

Critical fill level Send E-Mail Sen	d SMS					
Name Critical fill level						<b>м</b>
Comment Determine if a critical fill	evel is reached					
FB1 Comment Calculate the fill lev	el in percent					*
		Division		•		
True	•	⊖ En		Quotient	fillLevelPercent (AM1)	
fillLevel (AI0)	*	Dividend		Error	Signal unused	• ×
maxVolume (AM0)	*	Divisor				
						*
FB2 Comment Determine if 90% o	f the max. volume are i	reached				*
		Limit value switch		•		
True	•	O En	Limit value 1 0.9000	Output	evel90 (DM0)	<b>,</b>
fillLevelPercent (AM1)		Input	Limit value 2 0.8999	- (		
				_0		
	( 🍋 )		( ]	AI)		
						*

### 9. Add a new function block (FB3) below.

Name Critical fill level					<b>b</b>	ĸĂ
omment Determine if a critical fill level is read	hed					
B1 Comment Calculate the fill level in percer	nt				1	*
	Division		•			9
True •	En		Quotient	- fillLevelPercent (AM1)		
fillLevel (Al0)	Dividend		Error O-	<ul> <li>— Signal unused</li> </ul>	•	×
maxVolume (AM0)	Divisor					T
						*
B2 Comment Determine if 90% of the max.	volume are reached					-
	Limit value s	switch	•			*
True True		Limit value 1 0.9000	Output O-	- fillLevel90 (DM0)	•	<b>^</b> ]
fillLevelPercent (AM1)	Input	Limit value 2 0.8999	ouputo			X
	mpac					H
						•
						( 🎌 )

- 10. Select "Logical OR" as the function.
- 11. Interconnect the parameters as follows:
  - Input 1: float (DI0)
  - Input 2: fillLevel90 (DM0)
  - Output: critFillLevel (DM1)

omment Determine if a critical	fill level is reached					
B1 Comment Calculate the fill	level in percent					
		Division		•		1
True						<b>^</b>
	•	En En		Quotient	fillLevelPercent (AM1)	
fillLevel (AI0)	•	Dividend		Error	<ul> <li>Signal unused</li> </ul>	• >
maxVolume (AM0)	•	Divisor				
						_
						1
B2 Comment Determine if 909		are reached				
Determine if 905	% of the max. volume					1
		Limit value s	witch	•		
True	•	——————————————————————————————————————	Limit value 1 0.9000	Output 🔾 🗕	fillLevel90 (DM0)	• [
fillLevelPercent (AM1)	•	Input	Limit value 2 0.8999			>
						1
B3 Comment Set critFillLevel	if float is actuated (N	C) or 90% are reached				
		Logical OR		Ň	~0	2
True	•	——————————————————————————————————————		Outp	TFillLevel (DM1)	Ľ
float (DI0)	•				1)	
fillLevel90 (DM0)	· · · · · ·				9	( 🚩
0						C
Signal unused						

### 12. Negate input 1.

FB1 Comment Calculate the fill level in pe	ercent				
	Division		7		1
True			Quotient	fillLevelPercent (AM1)	<b>4</b>
fillLevel (AI0)	Dividend			- Signal unused	• >
maxVolume (AM0)	Divisor		Enor	olghar anasoa	_
	Divisor				
B2 Comment Determine if 90% of the m	ax. volume are reached				
	Limit value :	switch	۲		2
True	En	Limit value 1 0.9000	Output O-	fillLevel90 (DM0)	•
fillLevelPercent (AM1)	Input	Limit value 2 0.8999			>
					_
					1
FB3 Comment Set critFillLevel if float is a					
B3 Comment Set cht-litlevel if hoat is a		0			1
_	Logical OR		•		
True	En		Output 🔾 🗕	- critFillLevel (DM1)	•
float (DI0)	• • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • \bullet = \bullet = \bullet = \bullet = \bullet =\bullet \bullet =\bullet \bullet =\bullet \bullet =\bullet \bullet =\bullet =\bullet \bullet =\bullet \bullet =\bullet =\bullet =\bullet \bullet =\bullet \bullet =\bullet =\bullet =\bullet \bullet =\bullet =				>
fillLevel90 (DM0) Signal unused					
Signal unused					

13. Then click "Apply".

#### Programming email transmission

14. Add a new network.

omment Determine if a critical fil	I level is reached					
B1 Comment Calculate the fill le	evel in percent					
		Division		•		
True	•	——————————————————————————————————————		Quotient	fillLevelPercent (AM1)	L
fillLevel (Al0)	•	Dividend		Error	- Signal unused	• 3
maxVolume (AM0)	•	Divisor				
						_
						1
B2 Comment Determine if 90%	of the max. volum					[
		Limit value sv	vitch	•		, i
True	*	En	Limit value 1 0.9000	Output O	fillLevel90 (DM0)	• [
fillLevelPercent (AM1)	T	Input	Limit value 2 0.8999			:
						,
						Ļ
						1
B3 Comment Set critFillLevel if	float is actuated (r					4
		Logical OR		•		Ē
True	•	En En		Output 🔾	- critFillLevel (DM1)	• [
float (DI0)	•	Input 1				
fillLevel90 (DM0)	•	Input 2				
Signal unused	•	Input 3				_
Signal unused		O Input 4				1

- 15. Assign the name "Send email" to the network.
- 16. Add a new function block (FB1).

SIEMENS	SIMATIC RTU3041C	
User: admin	Program Next com	m
Log out		
▶ Start page	Critical fill level Send E-Mail	l
➤ System	Name Send E-Mail	
Diagnostics	Comment (A)	
▶ Maintenance		
→ LAN		
► WAN		
<ul> <li>Services</li> </ul>		
▹ Security	Apply	
<ul> <li>Users / groups</li> </ul>		

17. Select "Send email" as the function.

18. Interconnect the parameters as follows:

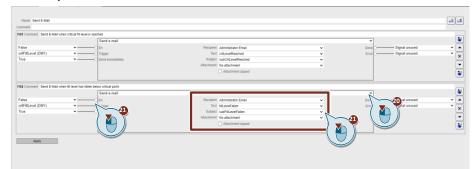
- Trigger: critFillLevel (DM1)
- Send immediately: True
- Recipient: Administrator email
- Text: critFillLevelReached
- Subject: subCritFillLevelReached



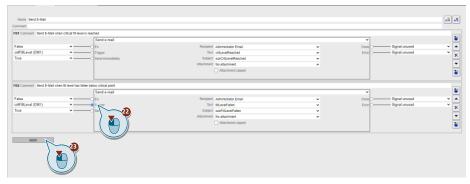
#### 19. Add a new function block (FB2).

Name Send E-Mail						×. 2.
Comment						
FB1 Comment Send E-Mail wh	hen critical fill level is reached					
	Send e-mail				×	*
False	<ul> <li>En</li> </ul>	Recipient	Administrator Email	~	Done Signal unused	~ 🔺
critFilLevel (DM1)	▼ Trigger	Text	critLeveReached	~	Error O-Signal unused	× ×
True	<ul> <li>C Bend immediately</li> </ul>		subCritLevelReached	~		
			No attachment	~		-
			<ul> <li>Attachment zipped</li> </ul>			<b>2</b>
						N 10
						$\sim$
						( 🍋

- 20. Select "Send email" as the function.
- 21. Interconnect the parameters as follows:
  - Trigger: critFillLevel (DM1)
  - Send immediately: True
  - Recipient: Administrator email
  - Text: fillLevelFallen
  - Subject: subFillLevelFallen



#### 22. Negate the "Trigger" input.



23. Then click "Apply".

#### Programming SMS transmission

24. Add a new network.

B1 Comment Send E-Mail w	when critical fill level is reached					
	Send e-mail			~		
False	✓O En	Recipient Administrator Email	~	Done O-	Signal unused	
ritFilLevel (DM1)	✓ ————————————————————————————————————	Text critLevelReached	~	Error	Signal unused	
frue	Send immediately	Subject subCritLevelReached	~			
		Attachment No attachment	~			-
		Attachment zipped				
	Send e-mail			~		*
False	✓OEn	Recipient Administrator Email	~	Done O-		
	C En	Recipient Administrator Email Text fill.evelFallen	~	Error O	Signal unused	
critFilLevel (DM1)	- Open		*			××
False critFilLavel (DM1) True	Trigper	Text fillevelFallen	*			× ×
critFilLevel (DM1)	Trigper	Teld MillevelFallen Subject subFill_evelFallen	*			××

25. Assign the name "Send SMS" to the network.

User: admin	Program	Next communication mode (cyclic / planned); 2021-03-21 06:06:00 (WAN) / Not planned		Number of active sessions: 1
Los		Next SMS check in sleep mode: Check permanently	Stor	10 <u>Utome</u> 7 (\$
+ Start page	Critical fill level Send E-Mail Send SMS			
+ System	Name: Send SMS			8. <b>8</b> .
+ Diagnostics	Connect 23			
+ Maintenance				
+ LAN				
+ WAN				
+ Services				
+ Security	Apply			
+ Users / groups				

26. Add a new function block (FB1).

User: admin	Prog	igram	Next communication node (cyclic / planned) 2027 45-21 96-05-09 (MAN) / Not planned Nucl SMS check in sleep mode: Check persavenity P2202	Number of active sessions: 1
+ Start page	Critical	al fill level Send E-Mail Send SMS		
+ System		Name Send SMS		×.
<ul> <li>Diagnostics</li> </ul>	Com	nnent -		
Maintenance     LAN				
+ WAN				
+ Services				
Security     Users / proups		Apply		

- 27. Select "Send SMS" as the function.
- 28. Interconnect the parameters as follows:
  - Trigger: critFillLevel (DM1)
  - Send immediately: True
  - Recipient: Administrator SMS
  - Text: critLevelReached

Name Send SMS Comment				Ka Ra
FB1 Comment True criff Illevel (DM1) True	Send SMS En Toger 48	Rocperf Annoxidae 545 Tel ( of Levillauted	Deep Entry	**

29. Add a new function block (FB2) below it.

Name Send SMS						Ka Ru
Comment						
FB1 Comment						
		Send SMS			~	2
True	×	En	Recipient Administrator SMS	*	Done O-Signal unused	* <b>*</b>
critFillLevel (DM1)	×	Trigger	Text critLevelReached	*	Error Signal unused	~ ×
True	•	Send immediately				
						-
						3

- 30. Select "Send SMS" as the function.
- 31. Interconnect the parameters as follows:
  - Trigger: critFillLevel (DM1)
  - Send immediately: True
  - Recipient: Administrator SMS
  - Text: fillLevelFallen

Name Send SMS					×,
Comment					
FB1 Comment					
	Send SMS			*	*
True	• En	Recipient Administrator SMS	~	Done Signal unused	× 🔺
critFilLevel (DM1)	Tripper	Text critLeveReached	~	Error O-Signal unused	× ×
True	<ul> <li>Send immediately</li> </ul>				9
					-
					2
FB2 Comment					
	Send SMS				2
True	•C En	Recipient Administrator SMS	N	Di 30 Inal unused	× 🔺
critFilLevel (DM1)	- Cripper	Text tilLevelFallen		E Fignal unused	× ×
True	·61				×
			( 🔼 ))		-
Apply					

#### 32. Negate the "Trigger" input.

Name Send SMS					<b>3.</b>
Comment					
FB1 Comment					
	Send SMS			×	2
True	•C En	Recipient Administrator SMS	*	Done Signal unused	• 🔺
critFilLevel (DM1)	VO Tripper	Text cttLeveReached	~	Error O-Signal unused	×
True	C Send immediately				×
					•
					2
FB2 Comment	L				
	Send SMS			~	*
True	V En	Recipient Administrator SMS		Done Common Signal unused	
critFilLevel (DM1)		Text fillcevelFallen	~	Error Signal unused	
True		1903 Millevel/allen	~	Error Signal unused	×
Inte					
					· · ·
Apply					
	X Y				

33. Then click "Apply".

#### **Programming GPS position**

34. Add a new network.

Send SMS				
Send SMS				
			*	
En	Recipient Administrator SMS	v	Done Signal unused	
C Trigger	Text crtt.eveReached	~	Error O-Signal unused	-
C Send immediately				*
				-
				2
				•
				2
Send SMS			v	•
C En	Recipient Administrator SMS	v	Done O Signal unused	× 🔺
Trigger	Text filLevelFaller	~	Error Signal unused	× ×
C Send immediately				×
	Send stmeduley Send stmeduley Send SMS Cit Toger	Copyon Tell of Landback     Contraction     Contraction	Speer         Tell         OthersReamed         •           Seed SMS         Seed SMS         •           Speer Theil Receiver Assessment Seed         •         •           Speer Theil Receiver Assessment Seed         •         •	Sord SMS     Init of Landade Model     Sord SMS     Sord SMS

35. Assign the name "GPS Position" to the network.

Critical fill level Send E-Mail Send SMS GPS Position	
New 019 Patos	1. I I I I I I I I I I I I I I I I I I I
- A409	

36. Add a new function block (FB1).



37. Select "GPS position" as the function.

38. Interconnect the parameters as follows:

- Postion: System location
- Radius (m): 1000
- Output: gpsPosition (DM2)
- Distance: distance (AM2)

Name GPS Position					ă, ŝi
FB1 Comment	GPS position			►.×	
True	▼	Poston	System location		Position (DM2)
Signal unused	✓ Latitude	Lattude	0.000000	Distr Dista	ince (AM2)
Signal unused	<ul> <li>Longitude</li> </ul>	Longtude	0.000000		
		Radius (m)			
		Max, age of the position (s)	0		

39. Add a new function block (FB2) below it.

Name GPS Position					×.
Comment					
FB1 Comment					
	GPS position			*	2
True	✓○ En	Position System location	~	Output gpsPosition (DM2)	✓ ▲
Signal unused	Latitude	Latitude 0.000000		Distance (AM2)	× ×
Signal unused	Longitude	Longitude 0.000000		Enter O	
		Radius (m) 1000			-
		Max. age of the position (s) 0			

- 40. Select "Send SMS" as the function.
- 41. Interconnect the parameters as follows:
  - Trigger: gpsPosition (DM2)
  - Send immediately: True
  - Recipient: Administrator SMS
  - Text: gpsPositionOK

Name GPS Position								×.
Comment								
FB1 Comment								
		GPS position				~		2
True	• <u> </u>	En	Position	System location	~	Output O	gpsPosition (DM2)	× 🔺
Signal unused	*	Latitude	Latitude	0.000000		Distance	distance (AM2)	× ×
Signal unused	v	Longitude	Longitude			Error	-	v 📃
			Radius (m)					-
			Max. age of the position (s)	0				
FB2 Comment								_
		Send SMS				N	-	*
True	×	En	Recipient Administrator SMS			Doney	40 unused	× 🛋
gpsPosition (DM2)	- 4.	Tracer	Text gpsPositionOK			Error	Tal unused	× 🖂
Signal unused		41 modiately	The gas and the		40			×
				/ 🗡				-
					- 11			
		//						*
		11						

42. Add a new function block (FB3) below.



- 43. Select "Send SMS" as the function.
- 44. Interconnect the parameters as follows:
  - Trigger: gpsPosition (DM2)
  - Send immediately: True
  - Recipient: Administrator SMS
  - Text: gpsPositionNotOK

Connect         OPS position         OPS position         Ops (an output of the sector)         Opp (an out	M M
Connet: PR Connet: Signal unced Unglick status (AU2) Signal unced Unglick status (AU2) Signal unced Unglick status (Signal Unglick st	
Tota         OP position         OP         Position Protein Souther         V           Signal unuesd         Linkin B         Linkin B         Distance         Op	
Tota     ♥     Cn     Patter Type Type Type Type Type Type Type Type	
Signal unused	*
Signal unused         unuplus is 300000         Env           Rada (a) II 1900         Max. spil of the position (b) 0         Env           Figs Comment // Trae	• 🔺
Radio (m) 1900 Mix. up of the position (n) &           F82 Connect!           True	× 💭
Max. upu dhe position (j) @           F82 Connect           Tea	×
F82 Connect	•
Seed SMS         V           True         V         Con         Receivert Administrator SMS         V         Down         Signal unused	*
True V C In Receiver Aminghato SMS V Down Signal unused	
True V C In Receiver Aminghato SMS V Down Signal unused	
True v En Recipient Administrator 5MS v Done Signal unused	
	• Ā
pgsPetition (DU2) •	×
Signa unused Dend immediately	
	2
FB3 Comment	-
Send SMS	2
True CEn Recipient Administrator SMS Don Don	× 🔺
gpsPosition(DM2) Tieger Tent gpsPositionNotOK	× ×
Signal unused	
	•
	2
100m	

#### 45. Negate the "Trigger" input.

lomment.								
FB1 Comment								
	0	GPS position				¥		
True	*CE	En	Pos	tion System location	*	Output	gpsPosition (DM2)	
Signal unused	¥L	Lattude	Lati	ude 0.000000		Distance	distance (AM2)	,
Signal unused	¥	Longitude	Longi	tude 0.000000		Error		,
			Radius	(m) 1000				
			Max. age of the position	n (S) 0				
B2 Comment	L							
B2 Comment	[	Send SMS				~		
True	×	En	Recipient Administrator SMS		~	Done		
psPosition (DM2)	• OT	Trigger	Text gpsPositionOK		~	Error	Signal unused	
Signal unused		Send immediately						
B3 Comment								
	5	Send SMS				~		
True		En	Recipient Administrator SMS		~	Done O	Signal unused	
gpsPosition (DM2)	×		Text gpsPositionNotOK		~	Error	Signal unused	
	•——							
Signal unused								
Apply N	-43							

46. Then click "Apply".

#### Configuring the connection to the TeleControl Server

A connection to the TeleControl Server must be established so that the RTU3041C can reach the TeleControl Server.

- 1. Navigate to the "TeleControl" menu.
- 2. Open the "TeleControl Basic" tab.

SIEMENS	SIMATIC RTU3041C
User: admin	TeleControl
Log out	
► Start page	Overview TeleControl Basic Data points
▶ System	Active
► Diagnostics	IP address or DNS name of the telecontrol server 77.7.
▶ Maintenance	Interface WAN  Port number 55097
► LAN	Project number 1
▶ WAN	Station number 1 Telecontrol password
▶ Services	Allow HTTP/S access via TeleControl Basic
► Security	Transmission settings
▶ Users / groups	Connection establishment delay (s) 10 Send monitoring time (s) 30
Operating mode	Key exchange interval (h) 1
▶ Tags	Discard events as long as the time of day is invalid.
► Expansion card	NOTE:
▶ GPS	When you activate telecontrol communication, the time-of-day synchronization is activated automatically and set by the telecontrol master station.
▶ Program	If time-of-day synchronization is already activated, the currently active method is maintained.
TeleControl	When you deactivate telecontrol communication and the time-of-day synchronization is activated by the telecontrol master station, the time-of-day synchronization is
Tag tables	automatically deactivated.

- 3. Enable the "Active" checkbox.
- 4. Enter the static IP address of the TeleControl server.
- 5. Select "WAN" as the interface.

Data points
Z Active
ame of the TT.T.
Interface WAN
ort number 55097
ct number 1
on number 1
password ·····
Allow HTTP/S access via TeleControl Basic

6. Enter the IPT listener port of the TeleControl server that you have enabled in your router (55097 by default) as the port number.

SIEMENS	SIMATIC RTU3041C
User: admin	TeleControl
Log out	
	Overview TeleControl Basic Data points
Start page	
▶ System	Active
▶ Diagnostics	IP address or DNS name of the telecontrol server 77.7.
	Interface WAN
Maintenance	Port number 55097
▶ LAN	Project number 1
	Station number 1
► WAN	Telecontrol password
▹ Services	Allow HTTP/S access via TeleControl Basic

#### 7. Enter

- a unique project number
- a unique station number and
- a TeleControl password.

SIEMENS SIMATIC RTU3041C

User: admin	TeleControl
Log out	
▶ Start page	Overview TeleControl Basic Data points
▶ System	Z Active
▶ Diagnostics	IP address or DNS name of the telecontrol server 77.7.
▶ Maintenance	Interface WAN  Port number 55097
► LAN	Project number 1
▶ WAN	Station number 1
▶ Services	Allow HTTP/S access via TeleControl Basic
▶ Security	Transmission settings
	Connection establishment delay (s) 10
Users / groups	Send monitoring time (s) 30
Operating mode	Key exchange interval (h) 1
▶ Tags	Discard events as long as the time of day is invalid.
• Expansion card	NOTE:
▶ GPS	When you activate telecontrol communication, the time-of-day synchronization is activated automatically and set by the telecontrol master station.
▶ Program	If time-of-day synchronization is already activated, the currently active method is maintained.
TeleControl	When you deactivate telecontrol communication and the time-of-day synchronization is activated by the telecontrol master station, the time-of-day synchronization is automatically deactivated.
▶ Tag tables	Apply
	A state of the

8. Then click "Apply".

9. Open the Data points tab.

SIEMENS	SIMATIC RTU3041C
User: admin	TeleControl
Log out	
► Start page	Overview TeleControl Basic Data points
▶ System	Name Digital inputs STATUS_ERROR
<ul> <li>Diagnostics</li> </ul>	STATUS_RUN
► Maintenance	float (DI0) enableReadFillLevel (DI1)
► LAN	fill_evel90 (DM0) crifill_evel (DM1) gsFostilon (DM2)
▶ WAN	Analog inputs gstatitude (OPS0)
▹ Services	gpsLongitude (GPS1) fillLevel (AI0)
Security	maxVolume (AM0) fillLevelPercent (AM1)
▶ Users / groups	distance (AM2) Counter inputs
Operating mode	STATUS, NEXT_COM_CYCLE MOB_SIG_QUAL
▶ Tags	MOB_CELL_ID MOB_TX_KB
Expansion card	MOB_RX_KB BAT_RES_CHARGE
▶ GPS	visibleSatellites (GPS3) timeLastPosition (GPS4)
► Program	Digital outputs fillLevel90 (DM0)
TeleControl	critFillLevel (DM1) gpsPosition (DM2)
▶ Tag tables	Analog outputs maxVolume (AM0)

- 10. Set the following settings for the digital input "float (DI0)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Transfer mode: Buffered transfer
- 11. Set the following settings for the digital input "enableReadFillLevel (DI1)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Transfer mode: Buffered transfer
- 12. Set the following settings for the digital input "gpsPosition (DM2)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Transfer mode: Buffered transfer
- 13. Set the following settings for the digital memory bit "critFillLevel (DM1)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Transfer mode: Unsolicited transfer
- 14. Set the following settings for the analog input "fillLevel (AI0)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Threshold (%): 5.00
  - Transfer mode: Buffered transfer

- 15. Set the following settings for the analog input "gpsLatitude (GPS0)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Transfer mode: Buffered transfer
- 16. Set the following settings for the analog input "gpsLongitude (GPS1)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Transfer mode: Buffered transfer
- 17. Set the following settings for the counter input "visibleSatellites (GPS3)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Transfer mode: Buffered transfer
- 18. Set the following settings for the counter input "timeLastPosition (GPS4)":
  - Transmission method: (Event (only current values))
  - Trigger: Change
  - Transfer mode: Buffered transfer
- 19. Then click "Apply".

### 2.2.2 Configuring the TeleControl Server Basic

To configure the TeleControl Server Basic, proceed as follows:

- 1. Open the program "CMT Configuration and Monitoring Tool" on your PG/PC. TeleControl Server Basic must be installed on the PG/PC.
- 2. Log in with your user data.

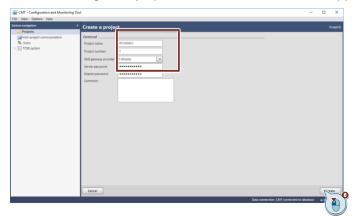


The following user data is preset at the factory:

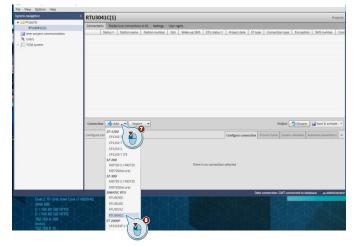
- User: administrator
- Password: 0000
- 3. When you log in for the first time, assign your own password.
- 4. Create a new project by clicking "Add".

View Options Help		
navigation	Projects	
Projects Inter-project communication Users TCS8 system	Status Name Project number Comment Activated connections	
CSB_RTU3041(1) was deleted.	Data connection: CM	connected to database 🛛 👗 admi

- 5. Assign a project name and a server password with which Engineering Stations can connect to the TeleControl server.
  - The server password is not relevant for this application example but must be assigned.
  - The SMS gateway operator is not relevant for this application example.



- **Note** The parameter "Project number" must match the parameter in Section 2.2.1 in the configuration of the connection to the TeleControl Server (<u>Step 7</u>).
  - 6. Then click "Create".
  - 7. Click "Add".
  - 8. Select "RTU3041C".



- 9. Enter
  - a station name
  - a unique station number and
  - a TeleControl password.

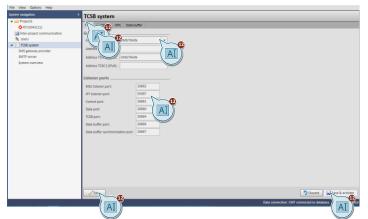
07 AL00	Add a connection	Add a connection _			
CP1242-7 GPRS	Add multiple connections	Station name:	Curi 1	Station number:	4
CP1242-7 V2 GPRS	-	station name:	Station 1	station number:	
CP1243-1		Slot:	0 💌		
CP1243-7 LTE		Telecontrol passwor	:	Repeat password:	
\$7-200				,	
MD720-3 / MD720					
MD720(Secure)					
\$7-300					
MD720-3 / MD720					
MD720(Secure)					
SIMATIC RTU					
RTU3030C					
RTU3010C					
RTU3031C					
RTU3041C					
ET 200SP					
CP1542SP-1 IRC					
					AI

- **Note** The parameters "Station number" and "TeleControl password" must match the parameters in Section 2.2.1 in the configuration of the connection to the TeleControl Server (<u>Step 7</u>).
  - 10. Click "OK".
- **Note** If you use more than one RTU, you can configure all RTUs in this step. To do this, select "Add multiple connections" and assign the station data. Click "OK".
  - 11. Click "Save & activate" and confirm the action in the drop-down list.

n navigation	4 RTU3041C(1)								Proj
Projects	Connections TeleService	e connections to ES	Settings User right						
RTU3041C(1)				Vake-up SMS CPU status ¥	Project data	S7 type	Connection type	Encryption	SMS numbe
Inter-project communication		ation 1 1	0	enc op sins   crossatos e	New	SIMATIC RTU	RTU3041C	HC-128	
Users	- Su	20011 1	0		INCH	SIMMING KTO	K1030410	HP-110	
TCS8 system									
								_	
	4								
						_			
		📥 Add 💌	× Delete Impo	rt v Wake up v			Project 🔊 D	Niscard S.	🛫 8. activat
		Add 🔹	X Delete Impo	rt 🔻 Wake up 💌			Project 🔊 D	Riscand 🛃 S.	e & activat
	Connection / Edit		X Delete Impo	rt 👻 Wake up 💌					$\sum$
			X Delete ] Impo	rt 🔻 Wake up 👻	Configure conne	ction Process	Project 🔊 D		$\sum$
	Connection Edit	ion 1 /		rt 👻 Wake up 💌	Configure conne	ction Process			$\sum$
	Connection / Edit	ion 1 /	X Delete   Impo	rt 👻 Wake up 💌	Configure conne	ction Process			
	Connection Edit	ion 1 /			Configure conne	ction Process			$\sum$
	Connection Zedit Configure connection Stati General Encryption	ion 1 /		rt V Wake up V	Configure conne	ction Process			$\sum$
	Connection Edit Configure connection Stati General Encryption Connection mode	ion 1 / G	Seneral	Station 1		ction Process	items System varia		$\sum$
	Connection Edit Configure connection Statis General Encryption Connection mode Communication monitori	ion 1 / G	ieneral		Configure conne	ction Process			$\sum$
	Connection Edit Configure connection Stati General Encryption Connection mode	ion 1 / G	ieneral	Station 1	Siot:	0	items System varia		$\sum$
	Connection Edit Configure connection Statis General Encryption Connection mode Communication monitori	ion 1 / G	Seneral	Station 1		0	items System varia		$\sum$
	Connection Edit Configure connection Statis Encryption Connection mode Communication monitori Cyclic services	ion 1 / G	Jeneral	Station 1	Siot:	0	items System varia		$\sum$
	Connection Edit Configure connection Statis Encryption Connection mode Communication monitori Cyclic services	ion 1 / G	ieneral	Station 1	Siot:	0	items System varia		$\sum$

12. Configure the IP address and the IPT listener port (55097) of the TeleControl server:

"TCSB system > "TCM" tab > General> Address TCM 1".



Note The "55097" must be enabled for communication in your DSL router.

The configuration of the TeleControl Server is now completed.



**Note** The status "Connected" is only displayed when the TeleControl server has a connection with the RTU3041C whose configuration data has been transferred to the runtime system.

#### 2.2.3 Configuring OPC UA Clients (UaExpert)

This section explains how to monitor the data points of the TCSB via OPC UA. The following is required to use the OPC UA Client "UaExpert":

- "UaExpert" is installed on your PC.
- OPC UA Server (TCSB) is activated (see <u>Section 2.2.2</u>).
- The configuration of the RTU3041C is loaded into the RTU.

To read the data via the OPC UA Client "UaExpert", proceed as follows:

- 1. Assign the PG/PC Client an IP address in the subnet of the router (according to <u>Table 2-1</u>).
- 2. Start "UaExpert" and click the "Add Server" button.

Unified Automation UaExpert - The OPC Unified Architecture Client - NewProject



3. In the dialog, double-click "< Double click to Add Server... >" in the "Custom Discovery" list area.

nfiguration Nan	ne	
Discovery	Advanced	
ndpoint Filter:	No Filter	•
Q Local		
🗸 💽 Local	Network	
> 😏 Mi	crosoft Terminal Servic	es
	C. 1817 1. 81 1	ork
> 💇 Mi	crosoft Windows Netw	UIK
willer	crosoft Windows Netw eb Client Network	OIK
> 💆 We		UK.
> 💆 We 🗸 🞯 Reven	eb Client Network	
> 💇 We ~ 😁 Reven	eb Client Network se Discovery	
> 💇 We > 😨 Reven 	eb Client Network se Discovery Double click to Add Re	verse Discovery

- 4. In the following dialog, enter the URL and the port of the OPC UA Server (TCSB) (e.g., <u>opc.tcp://192.168.0.100:4852</u>).
- 5. Click on "OK".

Discovery	Advanced			
Endpoint Fi	ter: No Filter			•
v ⊛ c	<ul> <li>Microsoft Windows Network</li> <li>Web Client Network</li> <li>everse Discovery</li> <li>Couble click to Add Reverse</li> <li>gonc.trp://localhost:4840</li> <li>ustom Discovery</li> <li>Couble click to Add Server.</li> </ul>	Ĩ		
3	Enter URL	?	Х	
Er	ter the URL of a computer with disc	covery service ru	inning:	

6. Select an endpoint of the OPC UA Server to which you want to establish a connection (for example: OPC.SimaticNET.TCSB (opc.tcp)/ None -None).

Discovery	Advanced
Endpoint Filt	ter: No Filter
	pcal
~ ~ ~	ocal Network
> e	VMware Shared Folders
> ē	Microsoft Terminal Services
> 🤕	Microsoft Windows Network
> 😌	Web Client Network
🛩 😼 Re	everse Discovery
4	< Double click to Add Reverse Discovery >
🔻 😼 Ci	ustom Discovery
-	P < Double click to Add Server >
- v 🔍	opc.tcp:// 192.168.0.100:4852
~	OPC.SimaticNET.TCSB (opc.tcp)
	None - None (uatcp-uasc-uabinary)

**Note** For test purposes, you can also create the connection without exchanging certificates. If you want a certificate exchange, you have to accept the certificate manually in the "CMT - Configuration and Monitoring Tool".

- 7. Enter the user data for the "CMT Configuration and Monitoring Tool".
- 8. Set the "Connect Automatically" checkbox.
- 9. Then confirm with "OK".

Add Server ?	×
onfiguration Name OPC.SimaticNET.TCSB	
Discovery Advanced	
Endpoint Filter: No Filter	•
Local     Local     Local Network     Deal Network	
Authentication Settings Anonymous	
Username Password	ŷ
Certificate	
Corport Automatically	Cancel

10. In the following dialog, accept the server certificate by setting the checkbox "Accept the server certificate temporarily for this session".

	rusted			
rtificate Chain				
lame	Trust Status			
B PLC-1/OPCUA	1 Untrusted			
rtificate Details				
rrors		_	_	
Error	ok [BadCertificateUntrusted]			1
ubject				d
Common Name	PLC-1/OPCUA-1			
Organization	Siemens			
OrganizationUnit				
Locality				1
State				
Country	DE			
DomainComponen	t			
isuer				
Common Name	PLC-1/OPCUA-1			
Organization	Siemens			
OrganizationUnit				
Locality				
State				
		Trust Sen	ver Certifi	cat

The certificate is not stored in the "UaExpert" trusted list.

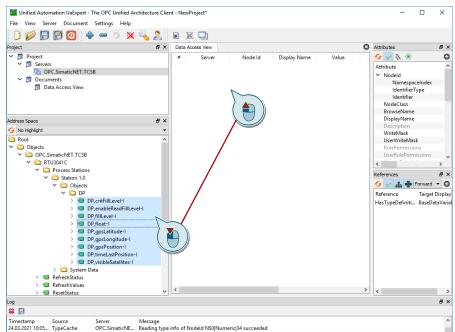
Note

To permanently add the certificate to the "UaExpert" trusted list, you must select "Trust Server Certificate".

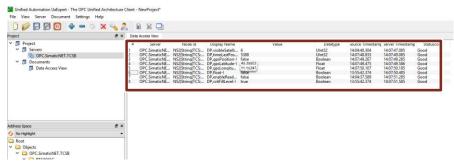
11. Then click "Continue".

BadCertificateUn	trusted	
tificate Chain		
ame	Trust Status	
S PLC-1/OPCUA	-1 Untrusted	
tificate Details		
rors		
Error	ok [BadCertificateUntrusted]	_
bject		
Common Name	PLC-1/OPCUA-1	
Organization	Siemens	
OrganizationUnit		
Locality		_
State		
Country	DE	
DomainComponer		
suer	n.	
Common Name	PLC-1/OPCUA-1	
Organization	Siemens	
OrganizationUnit		
Locality		
State		
51010		
	Trust Serve	er Certificat

12. Then locate the desired data points and drag them into the "Data Access view" window.



#### Result:



#### 2.2.4 Loading the Configuration File

The supplied archive "109739240\_RTU3041C\_ PROJ\_V30.zip" contains the finished configuration file ("\*.cfg"), which you can load into your RTU3041C and adapt to your application in just a few steps.

To load the supplied configuration into your RTU3041C, proceed as follows:

- 1. Connect the RTU3041C to your PG/PC via a network cable.
- **Note** Ensure that only one RTU is connected to your network at a time during commissioning, as each RTU is assigned the same IP address at the factory.
  - If necessary, change the IP address of your PG/PC (according to <u>Table 2-1</u>) so that it and the RTU3041C are in the same subnet.

The factory default IP address "<u>192.168.0.3</u>" is set in the RTU3041C.

- 3. Wake up the RTU3041C by briefly pressing the WKUP/RESET button on the RTU.
- 4. In a browser, open the web server of the RTU3041C at the address "<u>192.168.0.3</u>".
- 5. Log in with the username "admin" and the password "admin".
- 6. Assign a new password.
- 7. Navigate to the "Maintenance" menu.
- 8. Under "Load configuration", click "Search".

SIEMENS	SIMATIC RTU3041C
User: admin	Maintenance
Log out	
► Start page	Configuration Firmware Operating state Online support
▶ System	nfiguration
Diagnostics	File 109739240_RTU3041C_TCSB_V40.cfg Search
Mainten	Load on device
→ LAN	Load from SD card
▶ WAN	
▶ Services	Save configuration
▹ Security	Save on SD card
▶ Users / groups	Compress and encrypt file (optional)
▶ Operating mode	Password for optional encryption Save to PC
▶ Tags	Jane IVPC
► Expansion card	
▶ GPS	
▶ Program	

- 9. Select the downloaded configuration file.
- 10. Confirm with "Ok".

11. Click "Load on device".

SIEMENS	SIMATIC RTU3041C
User: admin	Maintenance
Log out	
► Start page	Configuration Firmware Operating state Online support
► System	Load configuration
▶ Diagnostics	File 109739240_RTU3041C_TCSB_V40.cfg Search
Maintenance	Load on device
→ LAN	Load from SD card
► WAN	
<ul> <li>Services</li> </ul>	Save configuration
Security	Save on SD card
► Users / groups	Compress and encrypt file (optional) Password for optional
<ul> <li>Operating mode</li> </ul>	encryption
▶ Tags	Save to PC
Expansion card	
→ GPS	
▶ Program	

- 12. The previously set password is overwritten with the password "RTU3041c!" stored in the configuration file.
- 13. Navigate to the "System > General" menu.
- 14. Assign the coordinates for your RTU3041C.

SIMATIC RTU3041C

SIEMENS	SIMATIC RTU3041C
User: admin	System
Log out	
	General Device info SD card System time
<ul> <li>Start page</li> </ul>	
<ul> <li>System</li> </ul>	Station name RTU1
▶ Diagnostics	Station description
Maintenance	Location
▶ LAN	Latitude 0.000000
P LAN	Longitude 0.000000
▶ WAN	
	End session after inactive period (minutes) 10 🗸
Services	
▹ Security	Apply

15. Then click "Apply".

- 16. Navigate to the "Operating mode" menu.
- 17. Enter the minimum duration of the service mode (e.g., "30 seconds") for the application described here.

Jser: admin	Operating mode	
Log out		
Start page	Operating modes Logging Power supply Battery lifetime	
Start page		
System	Update mode	
Diagnostics	Basic cycle 1 hour	~
Diagnostics	Start time of the update cycle 00:00:00	
Maintenance	Start day of the update cycle Monday	~
LAN	Additional update cycles 0	~
LAN	NOTE: For every ta	ag, you can set an individual update cycle with a
WAN	reduction fa	ictor.
Services	Communication mode	
Services	Communication mode Cyclic	~
Security	Basic cycle 12 hours	
	Start time of the communication cycle 00:00:00	
Users / groups	Start day of the communication cycle Monday	~
Operating mode	Minimum duration No	~
Tags	Str	art test communication mode
Expansion card		
	Sleep mode	
GPS	Turn on mobile wireless interface regularly and check for receipt of SMS message? No	~
Program	Start time of checking cycle 00:00:00	
TeleControl	Service mode	
Tag tables	Minimum duration 30 seconds	100
		2 🔤 🍸
		Apply

- 18. Then click "Apply".
- 19. Navigate to the "Users / groups" menu.

SIEMENS	SIMATIC RTU3041C				
User: admin Log.out	Users / groups		_		
<ul> <li>Start page</li> <li>System</li> <li>Diagnostics</li> </ul>	User Recipient groups NOT Max 1 About or Comp	any/department/position	User name admin	Phone number +4917xxxxxxxxxxx	E-mail address example@gmail.com
Maintenance LAN WAN					
Services     Security					
Users / ups     Operatir     Tags	Add Change user Name	Delete			
Fags     Expansion card     GPS	Role	+4917xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	20		
▶ Program	Allow receipt of SMS messages E-mail address	Yes Ves Ves Ves			
TeleControl     Tag tables	User name Password Repeat password	Change login data admin	U		
		Apply			

- 20. Enter the phone number with country code (e.g., "+49" for Germany).
- 21. Enter the email address for the "Administrator" user.
- 22. Change the password.

SIEMENS	SIMATIC RTU3041C						
User: admin Log.out	Users / groups	_	_	_			
Start page	User Recipient groups						
System	NOTE: Maximum number of users: 20						
r System		any/department/position	User name	Phone number	E-mail address		
▶ Diagnostics	1 Administrator		admin	+4917x0000000x	example@gmail.com		
Maintenance							
▶ LAN							
▶ WAN							
▹ Services							
Security							
Users / groups	Add	Delete					
<ul> <li>Operating mode</li> </ul>	Change user						
	Name	Administrator					
▶ Tags	Company/department/position						
Expansion card	Phone number	+4917x0000000x					
		Administrator 🗸					
▶ GPS	Allow receipt of SMS messages	Yes 🗸					
▶ Program	E-mail address	example@gmail.com					
TeleControl		Change login data					
➤ Tag tables	User name Password	admin					
	Repeat password	AI	Э				

23. Then click "Apply".

- 24. Navigate to the "WAN" menu.
- 25. Open the Mobile wireless settings tab.

SIEMEN	S	SIMATIC RTU3041C
User: admin		WAN
	Log out	
		Overview Mobile wireless settings Wireless cell SMS DynDNS
<ul> <li>Start page</li> </ul>		
► System		Enable mobile wireless interface
Diagnostics		PIN of the SIM card ····
▶ Maintenance		
<ul> <li>Maintenance</li> </ul>		Mobile wireless network parameter Global
▶ LAN		assignment
WAN.		Selection of the mobile wireless standard Automatic
24		eDRX interval (s) OFF
Servi Servi		PLMN 00000 0 for home PLMN of the SIM car
		Allow roaming
Security		
Users / groups		Enable data service in the mobile wireless network
		APN web.vodafone.de
<ul> <li>Operating mode</li> </ul>		Authentication method No authentication
▶ Tags		User name
. Europeine cont		Password
<ul> <li>Expansion card</li> </ul>		Specify DNS server addresses manually Preferred DNS server 0.0.0.0
▶ GPS		Alternative DNS server 0.0.0.0
		Enable answers to ping queries
▶ Program		
TeleControl		
. Teo febles		Notifications
Tag tables		When changing the IP address No
		Recipient group Administrator SMS V
		Logging
		Signal strength (CSQ / dBm) OFF
		Wireless cell identifier (CI) OFF
		Data sent (kB) OFF
		Data received (kB) OFF
		Apply 23

- 26. Enter the PIN of the inserted SIM card.
- 27. Enter the APN of your network operator.
- 28. Then click "Apply".

- 29. Navigate to the "Services" menu.
- 30. Open the "Email" tab.

SIEMENS	SIMATIC RTU3041C
User: admin	Services
Log out	
	Overview E-mail FTP
<ul> <li>Start page</li> </ul>	
▹ System	Active
Diagnostics	MTP server name xxx
. Bullinger	Port number 587
Maintenance	Interface WAN 🗸
► LAN	Connection security STARTTLS, if possible.
F LAN	Own e-mail address xxx@xxx.com
▶ WAN	User name xxx
	Password
Services	CA certificate
Security	Currently used file loaded Delete
	File used after applying
<ul> <li>Users / groups</li> </ul>	Load new file No file selected Search
Operating mode	Load on device
_	Encrypt zipped attachments
▶ Tags	Password
Expansion card	
▶ GPS	Additional communication cycle at a number of buffered e-mails 8
▶ Program	Appiy

- 31. Enter the server data of the email account that the RTU3041C should use to send emails.
- 32. Then click "Apply".
- 33. Navigate to the "TeleControl" menu.
- 34. Open the "TeleControl Basic" tab.

SIEMENS	SIMATIC RTU3041C
User: admin	TeleControl
Log out	
	Overview TeleControl Basic Data points
<ul> <li>Start page</li> </ul>	
▶ System	Active
	IP address of the of the
<ul> <li>Diagnostics</li> </ul>	telecontrol server
Maintenance	Port number 55097
	Project number 1
► LAN	Station number 1
► WAN	Telecontrol password
<ul> <li>Services</li> </ul>	Allow HTTP
Security	Transmission settings
	Connection establishment delay (s) 10
<ul> <li>Users / groups</li> </ul>	Send monitoring time (s) 30
▶ Operating mode	Key exchange interval (h) 1
▶ Tags	Discard events as long as the time of day is invalid.
Expansion card	NOTE:
▶ GPS	When you activate telecontrol communication, the time-of-day synchronization is activated automatically and set by the telecontrol master station.
▶ Program	If time-of-day synchronization is already activated, the currently active method is maintained.
TeleControl	When you deactivate telecontrol communication and the time-of-day synchronization is activated by the telecontrol master station, the time-of-day synchronization is automatically deactivated.
Tag tables	Apply

- 35. Enter the static WAN IP address of the DSL router to which the TeleControl Server is connected.
- 36. Enter the Telecontrol password.
- 37. Then click "Apply".

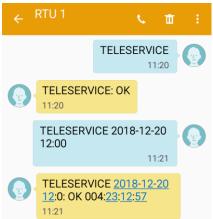
## 2.3 Operation

#### 2.3.1 RTU3041C Wake-Up by Mobile Phone

To read current process values, you can wake the RTU from sleep mode between two communication cycles.

- 1. To do this, send an SMS with the text "TELESERVICE" to the mobile phone number of the SIM card inserted in the RTU3041C.
- 2. The RTU acknowledges receipt of the wake-up SMS at the next time the mobile wireless interface turns on and connects to the TeleControl server.
- **Note** If you specify an appointment in the wake-up SMS, the RTU3041C will establish a connection with its communication partner at the exact time you specify in the SMS.
  - 3. To do this, send **"TELESERVICE YYYY-MM-DD hh:mm:ss"** to the mobile phone number of the SIM card inserted in the RTU3041C.

Figure 2-2: Alarm SMS



**Note** The telephone number from which the RTU is woken up must be stored and authorized in the RTU. You can find the setting in the web interface of the RTU under "Users / groups", see <u>Section 2.2.1</u>.

**Note** How often the RTU activates the mobile wireless interface and fetches received SMS depends on the configuration. The setting can be found in the web interface of the RTU under "Operating mode", see <u>Section 2.2.1</u>.

Note that enabling the mobile wireless interface increases the power consumption of the RTU.

#### 2.3.2 Determining the Exact Position of the RTU3041C via GPS

The exact position of the RTU3041C can be monitored via GPS. This section shows you how to determine the exact position of your RTU3041C via GPS.

For this scenario, the following is assumed:

- The configuration of the RTU3041C is loaded into the RTU (see Section 2.2.1).
- OPC UA Server (TCSB) is activated (see Section 2.2.2)
- OPC UA Client (UaExpert) is connected to the OPC UA Server (TCSB) (see <u>Section 2.2.3</u>).

To display the exact position of the RTU, proceed as follows:

1. To enter the GPS coordinates of the RTU3041C, open Google Maps, for example.



2. Get the GPS coordinates of your RTU3041C from UaExpert (follow the steps from <u>Section 2.2.3</u>).

Unified Automation UaExpert - The OPC Unified Architecture C File View Server Document Settings Help		NewProject				
🗋 🥟 🕞 🗭 💽 💠 🗕 🗞 🗙 🔌		e 🛛 🗖				
Project 🗗 🛪	Data	Access View				
✓	#	Server	Node Id	Display Name		Value
✓ Ø Servers ♦ OPC.SimaticNET.TCSB	1	OPC.SimaticNE	NS2 String TCS: NS2 String TCS:	DP,timeLastPos	5388	
✓ ∅ Documents ∅ Data Access View	3 4 5 6	OPC.SimaticNE OPC.SimaticNE	NS2 String TCS: NS2 String TCS: NS2 String TCS: NS2 String TCS:	DP, qpsLatitude- DP, qpsLongitu	49.39953 11.16347	
	78	OPC.SimaticNE	NS2 String TCS: NS2 String TCS:	DP, enableRead	false true	

3. Enter the GPS coordinates (49.39953,11.16347) into Google Maps.



4. The exact location of your RTU is shown on Google Maps.



# 3 Useful Information

#### 3.1.1 Update and Communication Mode

The RTU cyclically changes from sleep mode to update or communication mode. The frequency of the update and communication cycles can be defined.

Figure 3-1: Parameterization of the operating mode

SIEMENS	SIMATIC RTU3041C
User: admin	Operating mode
	Operating modes Logging Power supply Battery lifetime
<ul> <li>Start page</li> </ul>	
▶ System	Update mode
Disconcion	Basic cycle 10 seconds
<ul> <li>Diagnostics</li> </ul>	Start time of the update cycle 00:00:00
▶ Maintenance	Start day of the update cycle Monday V
	Additional update cycles 0
► LAN	NOTE: For every tag, you can set an individual update cycle with a reduction factor.
▶ WAN	
Services	Communication mode
. Consulta	Communication mode Cyclic 🗸
▹ Security	Basic cycle 10 minutes
Users / groups	Start time of the communication cycle 00:00:00
	Start day of the communication cycle Monday
<ul> <li>Operating mode</li> </ul>	Minimum duration No 🗸
▶ Tags	
	Start test communication mode
<ul> <li>Expansion card</li> </ul>	Sleep mode
▶ GPS	
	Turn on mobile wireless interface regularly and check for receipt of SMS message? 1 hour
▶ Program	Start time of checking cycle 00:00:00
TeleControl	
	Service mode
► Tag tables	Minimum duration 2 minutes
	Arabi
	Apply

#### Update mode

In update mode, the RTU goes through the following steps:

- Reading the inputs that were configured for the current cycle
- Editing the program blocks
- Writing of outputs
- Saving the process data to the SD card (with activated logging)

After the update mode, the RTU falls back into sleep mode or switches to communication mode if this is configured. The update and communication cycles can also run independently of each other.

**Note** In order for the RTU to transmit current values of the data points, the update cycle must be parameterized at least as frequently as the communication cycle.

#### **Configurable events**

In addition to the configured update cycle, the RTU switches from sleep mode to update mode when configurable events occur. You can configure the following events:

- Value change at analog input "AI0"
- Edge change at a digital input
- Triggering timers of program blocks (e.g., with the pulse generator or with the on/off delay).

Figure 3-2: Parameterization of the additional update mode

SIEMENS	SIMAT	IC RTU	3041C						
User: admin	Tags					_			
Start page	Overview	Digital in	inputs	Digital outp	uts Digital memory bits	Analog inputs	Analog m	emory bits	Temperature (in
		Active	Name	Т	ype	Text for ON / Uni	it	Text for OF	F / Format I
► System	0	Yes	float	0	ligital input	1		0	
	1 1	Yes	enableR	eadFillL D	ligital input	1		0	
▶ Diagnostics		No			ligital input				
		No			ligital input				
Maintenance		No No			ligital input ligital input				
	5 1	ND			iiditai indut				
▶ LAN									
					Active				
► WAN				Name	float				
				Type	Digital input		~		
<ul> <li>Services</li> </ul>						0			
				Current value	_	Read			
<ul> <li>Security</li> </ul>			ι	Jpdate cycle	1				
	1	Reduction	factor fo	or basic cycle	1 👻				
<ul> <li>Users / groups</li> </ul>		Lind	tata avalu	a of this input	- Basic cycle: 10 Minutes	5.			
		Opu	late cycle	e of this inpu	Quala of the input: 40 M	flautaa	_		_
<ul> <li>Operating mode</li> </ul>	Additiona	I update c	cycle on v	value change	Yes, also in sleep mode	~			
				Forma	t				
<ul> <li>Tags</li> </ul>				Text for ON	1				
				Text for OFF	0				
Expansion card									
				Logging					
▶ GPS			0	Current value	OFF	~			
▶ Program					Apply				
. TeleCentral					/ dp/yy				
<ul> <li>TeleControl</li> </ul>									
. Tag tablas									
<ul> <li>Tag tables</li> </ul>									

Note

Note that monitoring configured events will result in higher power consumption.

#### **Communication mode**

In communication mode, the RTU performs the following tasks:

- Sending the data telegrams to the configured communication partner in the control center
- Sending saved messages (SMS, emails)
- Synchronization of the time (if configured)

In addition to the previously mentioned tasks, a connection from the TeleControl server or the configuration PC to the WBM of the RTU can be established in communication mode. This enables diagnosis of the RTU and maintenance work.

#### Switching on the mobile wireless interface

Independently of the communication cycle, you can define how often the mobile wireless interface should be switched on to pick up possible wake-up SMS messages. Thereby, no connection to the TeleControl server is established.

You also specify this in the web interface under "Operating mode".

Figure 3-3: Switching on the mobile wireless interface

Sleen mode	
Turn on mobile wireless interface regularly and check for receipt of wake-up SMS message? 1 hour	r 🗸
Start time of checking cycle 00:00	):00

Note

Note that this will increase the power consumption of the RTU.

#### 3.1.2 Transmission Types of the Data Points

The RTU has different transmission modes to transfer data points. You can parameterize the transmission type for each data point individually.

Figure 3-4:	Set	transmission type
-------------	-----	-------------------

Name	Data point name	Data type	Type of transfer	Index	Threshold (%)	Threshold (abs.)	Transfer mode	
Digital inputs								
STATUS_ERROR	STATUS_ERROR-I	1 Bit (1.1)	Only internal use	✓ 4000			Buffered transfer	N
STATUS_RUN	STATUS_RUN-I	1 Bit (1.1)	Only internations	1001			Buffered transfer	
floatCritFillLevel (DI0)	floatCritFillLevel-I	1 Bit (1.1)	Event (only current value)	$\checkmark$			Buffered transfer	
fillLevel90 (DM0)	fillLevel90-I	1 Bit (1.1)	Only internal use	$\checkmark$			Buffered transfer	N
critFillLevel (DM1)	critFillLevel-I	1 Bit (1.1)	Event (only current value)	$\checkmark$			Unsolicited transfer	
Analog inputs				_				
fillLevel (AI0)	fillLevel-I	32 Bit Float (3.3)	Event (only current value)	$\checkmark$	5.00	500.00	Buffered transfer	
maxVolume (AM0)	maxVolume-I	32 Bit Float (3.3)				0.00	Buffered transfer	1
fillLevelPercent (AM1)	fillLevelPercent-I	32 Bit Float (3.3)	Only internal use	✓ 4		5.00	Buffered transfer	1
Counter inputs								
Digital outputs								
fillLevel90 (DM0)	fillLevel90-Q	1 Bit (2.1)	Only internal use	✓ 7			Buffered transfer	1
critFillLevel (DM1)	critFillLevel-Q	1 Bit (2.1)	Only internal use	<b>∨</b> 9			Buffered transfer	N
Analog outputs								
maxVolume (AM0)	maxVolume-Q	32 Bit Float (4.3)	Only internal use	<b>∨</b> 3			Buffered transfer	N
fillLevelPercent (AM1)	fillLevelPercent-Q	32 Bit Float (4.3)	Only internal use	✓ 5			Buffered transfer	N

#### Transfer after call

The current value of the data point is stored in the RTU. New values of a data point overwrite the last stored value.

In communication mode, the current value at that time is transmitted.

#### Event (current value)

If the transmission type "Event" is selected, a threshold (absolute or percentage) can be specified for each data point. Only if the value of the data point has changed beyond this threshold is this is evaluated as an event and the new value stored. New values of a data point overwrite the last stored value.

In communication mode, the last stored value is transmitted.

#### Event (any value)

All values that differ from the last stored value are stored in chronological order and transmitted to the communication partner during the communication mode.

Since the HMI does not support the OPC UA function "HistoryRead" and only the last value is always transferred, this transfer type has no advantage for this example.

#### 3.1.3 Transmission Mode of the Data Points

If you parameterize "Event (current value)" or "Event (any value)" as the transmission type, you can additionally select a transmission mode for each data point.

Name	Data point name	Data type	Type of transfer	Index	Threshold (%)	Threshold (abs.)	Transfer mode	
Digital inputs								
STATUS_ERROR	STATUS_ERROR-I	1 Bit (1.1)	Only internal use	✓ 4000			Buffered transfer	•
STATUS_RUN	STATUS_RUN-I	1 Bit (1.1)	Only internal use	✓ 4001		-	Duffored transfer	
floatCritFillLevel (DI0)	floatCritFillLevel-I	1 Bit (1.1)	Event (only current value)	∨ 0			Buffered transfer	
fillLevel90 (DM0)	fillLevel90-I	1 Bit (1.1)	Only internal use	∨ 6			Buffered transfer	
critFillLevel (DM1)	critFillLevel-I	1 Bit (1.1)	Event (only current value)	∨ 8			Unsolicited transfer	•
Analog inputs								
fillLevel (AI0)	fillLevel-I	32 Bit Float (3.3)	Event (only current value)	✓ 1	5.00	500.00	Buffered transfer	•
maxVolume (AM0)	maxVolume-I	32 Bit Float (3.3)	Only internal use	✓ 2		0.00	-	-
fillLevelPercent (AM1)	fillLevelPercent-I	32 Bit Float (3.3)	Only internal use	✓ 4		5.00	Buffered transfer	•
Counter inputs								_
Digital outputs								
fillLevel90 (DM0)	fillLevel90-Q	1 Bit (2.1)	Only internal use	∨ 7			Buffered transfer	1
critFillLevel (DM1)	critFillLevel-Q	1 Bit (2.1)	Only internal use	✓ 9			Buffered transfer	
Analog outputs								
maxVolume (AM0)	maxVolume-Q	32 Bit Float (4.3)	Only internal use	∨ 3			Buffered transfer	1
fillLevelPercent (AM1)	fillLevelPercent-Q	32 Bit Float (4.3)	Only internal use	✓ 5			Buffered transfer	

#### Figure 3-5: Transmission modes

Table 3-1: Differences between the transmission modes

Transmission mode	Explanation
Buffered transmission	The stored value of the data point is transmitted in the next communication mode.
Unsolicited transfer	A value change of the datapoint (event) starts an additional communication mode. The data point is transmitted immediately. In this application example, this is parameterized at the memory bit "critFillLevel".

# 4 Appendix

### 4.1 Service and support

#### **Industry Online Support**

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

support.industry.siemens.com

#### **Technical Support**

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts.

Please send queries to Technical Support via Web form:

support.industry.siemens.com/cs/my/src

#### SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

siemens.com/sitrain

#### Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

support.industry.siemens.com/cs/sc

#### Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android: support.industry.siemens.com/cs/ww/en/sc/2067

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# 4.2 Industry Mall



The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location: mall.industry.siemens.com

## 4.3 Application support

Siemens AG Digital Factory Division Factory Automation Production Machines DF FA PMA APC Frauenauracher Str. 80 91056 Erlangen, Germany

mailto: tech.team.motioncontrol@siemens.com

# 4.4 Links and literature

Table 4-1

No.	Subject		
\1\	Siemens Industry Online Support https://support.industry.siemens.com		
\2\	Link to the entry page of the application example https://support.industry.siemens.com/cs/ww/en/view/109739240		
/3/	SIMATIC: TeleControl - RTU - RTU3030C/RTU30x1C https://support.industry.siemens.com/cs/ww/en/view/109750942		
\4\	Instruction manual SITRANS LU150 https://support.industry.siemens.com/cs/ww/en/view/109739505		
\5\	Manual and download for UaExpert: https://www.unified-automation.com/downloads/opc-ua-clients.html		

# 4.5 Change documentation

Table 4-2

Version	Date	Change
V1.0	10/2016	First version
V2.0	01/2019	<ul><li>Migration to TeleControl Server Basic V3.1</li><li>Using UaExpert as OPC UA Client</li></ul>
V3.0	06/2021	<ul><li>Expansion with the GPS functions of a RTU30x1C:</li><li>Time synchronization</li><li>Position determination</li></ul>