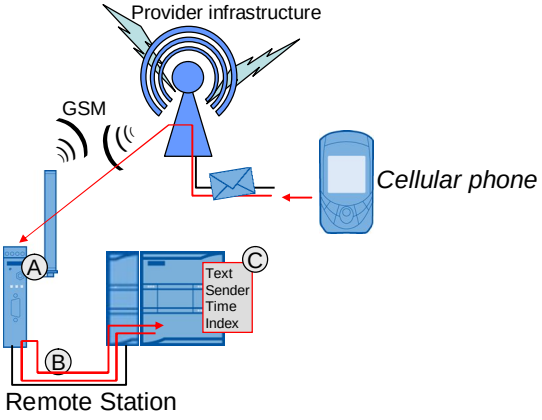
1.4.3 Receiving text messages

Figure 1-8



The following steps are executed when receiving text messages.

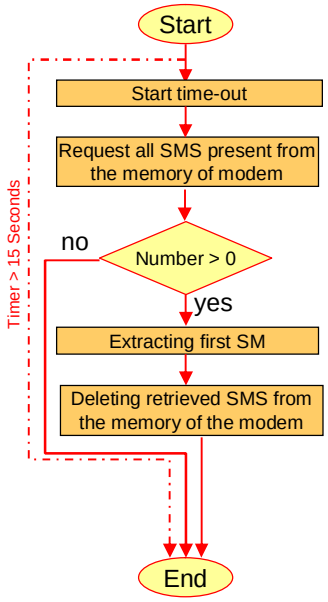
Receiving text messages and displaying information

Table 1-9

Digit	Description
A	If a SMS is received by the MD720-3 modem from a cellular phone or another remote station, this SMS is stored non-volatile in the internal memory of the modem. In the process, the SMS is assigned an index number with which this SMS can be identified. A max. of 100 SMS can be stored.
B	The S7-1200 controller checks the modem's memory, whether SMS are present and transfers one SMS in the memory of the S7-1200 controller.
C	In the S7-1200 controller the different information of the SMS is extracted and provided separately. This is • SMS text • Send number • Date and time (this time stamp was assigned by the provider) • Index number

The receive routine in detail

Figure 1-9



During this routine for receiving SMS, every step is monitored. If a step cannot be performed, this leads to a respective comment in the status word. The routine is interrupted.

If the above step chain is terminated neither positive nor negative after a maximum of 15 seconds, the routine is interrupted.

Always only one SMS is retrieved and this SMS is immediately deleted from the modem's memory after transmission to the S7-1200 controller. It therefore has to be made sure that the content of the previous SMS was successfully processed between two receive routines.

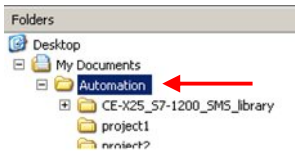
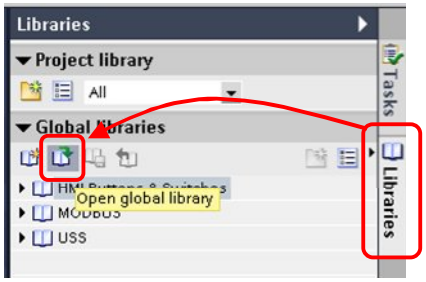
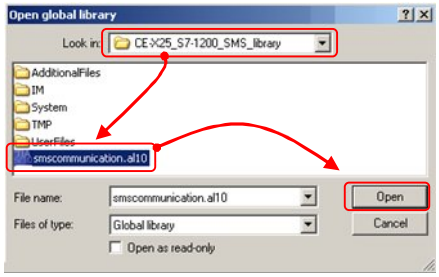
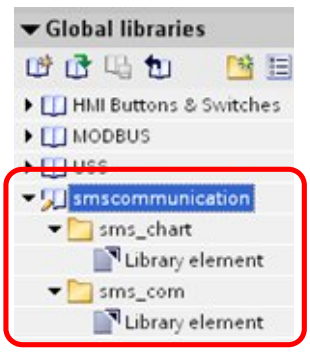
It cannot be ensured that the SMS is stored in the modem's memory in the correct time sequence and is retrieved from there accordingly.

2 Working with the Library

2.1 Integrating the library into STEP 7 V11

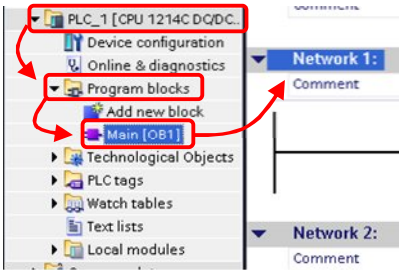
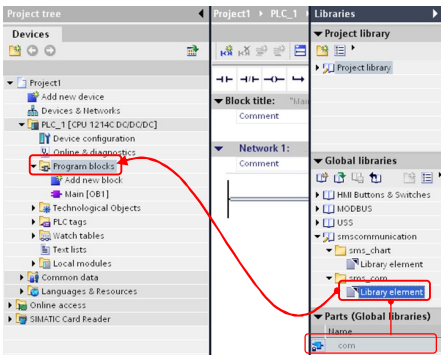
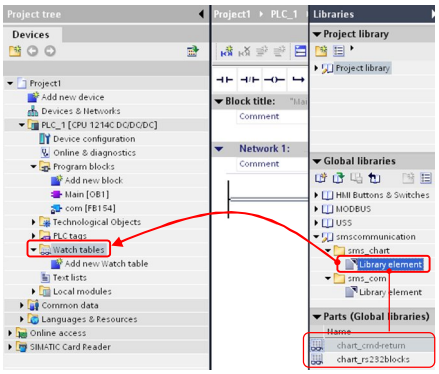
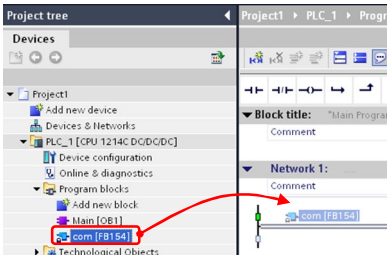
In order to use the previously described library functions, they have to be integrated into the configuration software first. The necessary steps are listed in the following table.

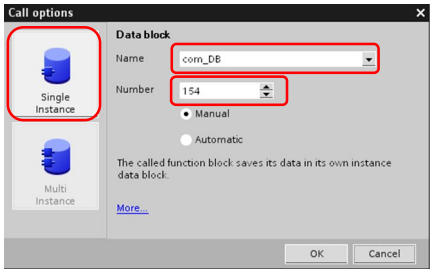
Table 2-1

Step	Function	Figure/remark
1.	The library is available on the HTML page from which you have downloaded this document. Save the library to your hard disk. Table 1-4	It is recommended to file all STEP 7 V11 projects and libraries in the “Automation” directory. 
2.	Open STEP 7 V11.	
3.	• Enable the “Library” tab • Click the “Open global library” button	
4.	• Navigate into the folder in which the library file with ending *.al10 is located • Mark the file and confirm with “Open”	
5.	• The library is now loaded and is instantly available under “Global libraries”	

2.2 Using library blocks

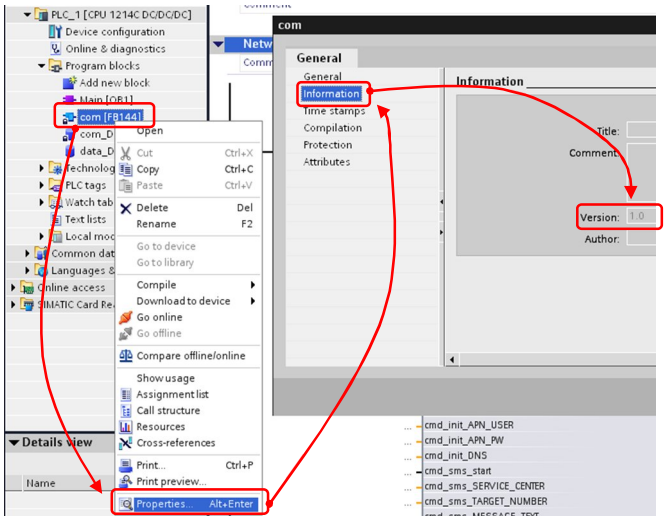
Table 2-2

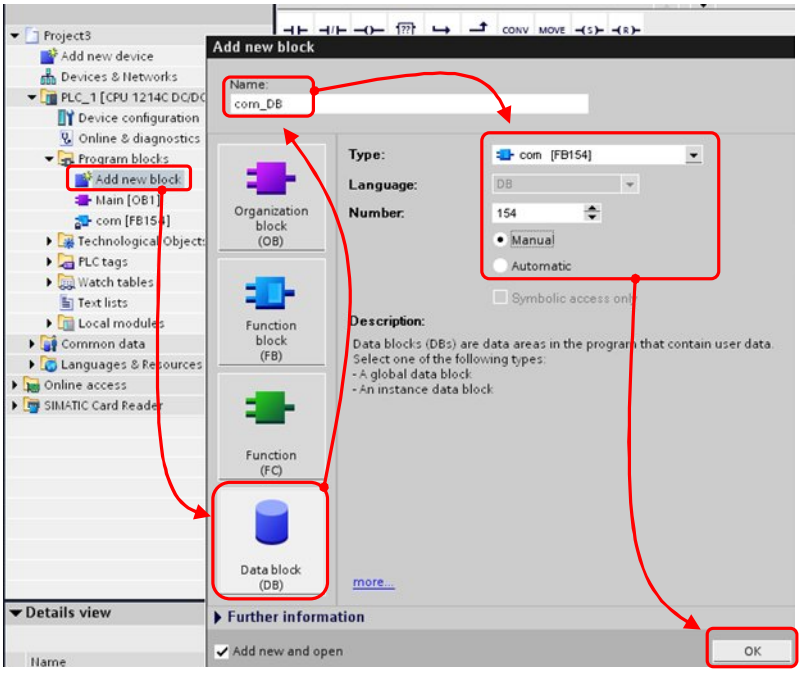
Step	Function	Figure/remark
1.	• Open STEP 7 V11 to create a new project • Add the desired S7-1200 controller with the help of “Add new device”	All controller types of the S7-1200 series can be used in combination with this library
2.	• Navigate into the “Program blocks” folder • Open the OB1 “Organization block”	
3.	• From the opened “smscommunication” library, navigate into the “sms_com” library group • Add the “Library elements” of this group to the “Program blocks” folder via Drag&Drop	
4.	• From the opened “smscommunication” library, navigate into the “sms_chart” library group • Add the “Library elements” of this group to the “Watch tables” folder via Drag&Drop	
5.	• Now drag the “com[FB144]” function block via Drag&Drop into any network in the previously opened OB1	

Step	Function	Figure/remark
6.	• Select an instance data block, indicating a “Name” and “Number” • Confirm with “OK”	
7.	The numbers and symbolic names of the library blocks can be freely assigned. However, please note that the watch tables included will then only have limited function.	

2.3 Checking and updating library version

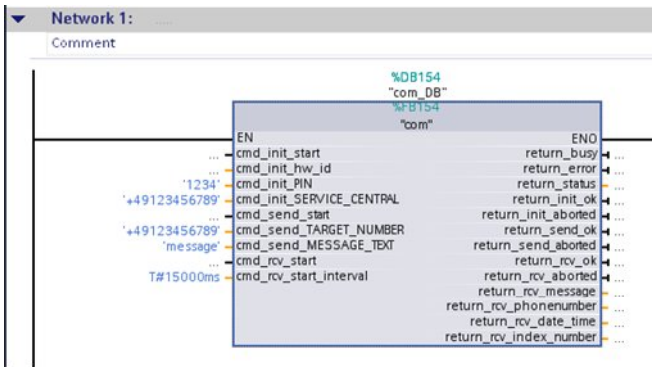
Table 2-3

Step	Function	Figure/remark
1.		
2. "	Execute the following steps for each element of the library. • Right-click the function or the data block and select the “Properties” option in the context menu • In the displayed “Properties” window select the “Information” menu Compare the current version number in the “Version” output field with the latest status from the Service&Support portal	
3.	If you wish to update the library, add the most current library now as described under chapter #.	
4.	• Delete all relevant elements under the “Program blocks” folder • Do not delete the function block call in OB1	
5.	Add the “sms_com” elements of the library group to the program block as described in Table 2-1 up to step 3.	
6.	The updated block elements are now available in the program block. However, the original call of the “com[FB154]” function block still displays one missing instance data block.	

Step	Function	Figure/remark
7.		
8.	Add the instance data block manually • Double-click the “Add new block” button • Mark the “Data block” block type and select “Name” • The “com[FB154]” instance data block is selected as data block type Confirm with “OK”	
9.	The library update is now completed.	

3 Interface Description of the Library

Figure 3-1



3.1 Parameters for initialization: _init_

Figure 3-2

Table 3-1

No.	Designation	Transmission	Data type	Description/note
1.	cmd_init_start	IN	Bool	• Enables the initialization process • Reacts to a positive edge • The start command is stored as long as the “com” function block is already in process. The block always saves only one start command provided it cannot be processed instantly.
2.	cmd_init_hw_id	IN	PORT	• Hardware ID of the RS232 communication module • Default value: 11; input not necessary, provided the RS232 CM was inserted in the first slot on the left of the S7-1200 and no expansion modules were inserted on the right • Check hardware ID in device information/RS232_1-Properties/RS232 interface/IO addresses/HW identifier
3.	cmd_init_PIN	IN	String	• PIN number of the SIM card inserted in the modem • If the PIN number is disabled, “0000” has to be entered • Permissible value: Maximum 4 characters

No.	Designation	Transmission	Data type	Description/note
4.	cmd_init_SERVICE_CENTRAL	IN	String	• The short message center of your provider is to be entered here (Example: +49123456789) • Permissible value: Maximum 20 characters
5.	return_init_ok	OUT	Bool	• Gives feedback when initialization of the modem was successful and the modem is therefore ready to operate • Stays TRUE until initialization is triggered again • Default value: FALSE
6.	return_init_aborted	OUT	Bool	• Gives feedback when initialization of modem terminated incorrectly • Relevant in combination with Table 3-4 no. 3 • Stays TRUE until initialization is triggered again • Default value: TRUE

3.2 Parameters for SMS sending _send_

Figure 3-3

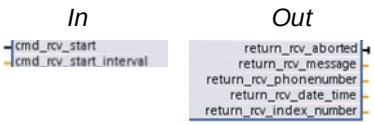
Table 3-2

No.	Designation	Transmission	Data type	Description/note
1.	cmd_send_start	IN	Bool	• Starts the procedure for sending SMS • Reacts to a positive edge • The start command is stored as long as the “com” function block is already in process. The block always saves only one start command provided it cannot be processed instantly.
2.	cmd_send_TARGET_NUMBER	IN	String	• Receiver’s telephone number of the device to which the SMS is to be sent • Example: +49123456789 • Permissible value: Maximum 20 characters
3.	cmd_send_MESSAGE_TEXT	IN	String	• Text content of the SMS which is to be sent • Permissible value: Maximum 160 characters • Process values can be embedded with the “VAL_STRING” command
4.	return_send_ok	OUT	Bool	• Gives feedback when the last job for sending SMS was terminated successfully • Stays TRUE until next job is triggered again • Default value: FALSE

No.	Designation	Transmission	Data type	Description/note
5.	return_send_aborted	OUT	Bool	• Gives feedback when the last job for sending SMS was not successfully terminated • Relevant in combination with Table 3-4 no. 3 • Stays TRUE until next job is triggered again • Default value: TRUE

3.3 Parameters for SMS receiving: _rcv_

Figure 3-4



-

Table 3-3

No.	Designation	Transmission	Data type	Description/note
1.	cmd_rcv_start	IN	Bool	• Starts the process for receiving (retrieving) of a SMS from the modem • Reacts to a positive edge • The start command is stored as long as the “com” function block is already in process. The block always saves only one start command provided it cannot be processed instantly.
2.	cmd_rcv_start_interval	IN	Time	• Indicates an interval in which the process for receiving (retrieving) a SMS from the modem is started automatically • Input in milliseconds • Permissible value: >= 5000 (ms) • Interval can be ended by setting the value to < 5000 (ms)
3.	return_rcv_ok	OUT	Bool	• Gives feedback when the last job for retrieving SMS was successfully terminated • Stays TRUE until next job is triggered again • Default value: FALSE
4.	return_rcv_aborted	OUT	Bool	• Gives feedback when the last job for retrieving SMS was not successfully terminated • Relevant in combination with Table 3-4 no. 3 • In combination with the 7030 status it is signaled that no SMS was present in the memory of the modem • Stays TRUE until next job is triggered again • Default value: TRUE
5.	return_rcv_message	OUT	String	• Displays the SMS text content

No.	Designation	Transmission	Data type	Description/note
6.	return_rcv_phonenumber	OUT	String	• Indicates the number of the device from which the SMS was sent
7.	return_rcv_date_time	OUT	DTL	• Indicates the time stamp which is saved in the SMS • This is the time stamp which the provider provides at the time of delivery. This is not the time stamp at the time of sending the SMS from the cellular phone or remote station. • The elements “Nanosecond” and “Weekday” of the DTL time format are not present
8.	return_rcv_index_number	OUT	Int	• Indicates the index number of the SMS from the modem memory of the modem

3.4 Return parameter: return_

Figure 4-7

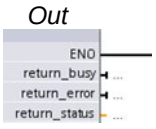


Table 3-4

No.	Designation	Transmission	Data type	Description/note
1.	return_busy	OUT	Bool	• Signals when the “com[FB154]” block is busy with processing a routing • Takes on the TRUE state once a “cmd_” command was triggered. • Can also take on the TRUE state when the RCV routine is called cyclically with the help of the “cmd_rcv_start_interval” parameter. • Takes on the FALSE state as soon the routine is terminated
2.	return_error	OUT	Bool	• Gives feedback if an error occurred during the processing of a routine • Always relevant in combination with Table 3-4 no. 3
3.	return_status	OUT	Int	• In the case of an error, returns the status to be able to localize the cause of the error • Always to be noted in combination with the status list from Table 4-1

4 Status Word of the Library

Every routine of the “com[FB154]” function data block indicates the cause of the error via a joint status word if terminating the respective routine was not successful. The symbolic address of the variable is “return_status”.

The status word is output in form of a decimal number and can be assigned as displayed in the following table.

Table 4-1

Status	Description	Support/Remark
1000	Buffer in the RS232 communication module could not be deleted	• Read out diagnostic buffer of the controller • Read out the “com_DB[DB154].rst_rcv_status” variable and compare it with\2\ chapter 8.6.7
1010	The currently relevant AT command could not be sent from the RS232 communication module to the MD720-3	• Read out diagnostic buffer of the controller • Check cabling between RS232 communication module and MD720-3 (Use a modem cable, not a null modem cable) • Read out the “com_DB[DB154].ptp_send_status” variable and compare it with \2\ chapter 8.6.5.
3000	The port configuration was finished incorrectly: PORT_CFG	• Read out the “com_DB[DB154].cfg_port_status” variable and compare it with \2\ chapter 8.6.2
3010	The configuration for receiving the characters was finished incorrectly: RCV_CFG	• Read out the “com_DB[DB154].cfg_rcv_status” variable and compare it with\2\ chapter 8.6.4
3020	The configuration for sending the characters was finished incorrectly: SEND_CFG	• Read out the “com_DB[DB154].cfg_send_status” variable and compare it with \2\ chapter 8.6.3
3999	A time-out occurred during the configuration of the RS232 module.	• Incorrect hardware ID transferred on the input of the “com[FB154]” block (see Table 3-1 no. 2)
4120	PIN could not be transferred	• Check appropriate parameter on the inputs of the “com[FB154]” function block • Indicate parameters by using an apostrophe ’, not inverted commas “ • Always specify cellular telephone numbers in syntax +<country code><area/provider ><number>
4160 /4200	The short message center could not be transferred	
4999	A time-out occurred during the modem initialization	• Check connectivity between S7-1200 controller and MD720-3 • Check whether the used cable is a modem cable (serial standard cable) and not a null modem cable (cf. http://en.wikipedia.org/wiki/Null_modem)
7030	No SMS in the MD720-3 modem memory	• This is a valid termination of the RCV routine if there is no SMS in the memory of the modem • If you receive this status although there should be one or more SMS in the modem, check the memory of the modem manually with hyper-terminal and with the AT+CMGL command • If the SMS is really present in the memory of the modem, then save the “com_DB[DB154].compare_string” variable at

Status	Description	Support/Remark
		the time after a RCV routine. Post this string in the forum of the Service&Support portal in combination with the used modem, hardware status and firmware status
7080	The SMS just retrieved could not be deleted from the memory of the MD720-3 modem.	
7999	The telegram which was to be sent from this station was not accepted by the modem	• Check connectivity between S7-1200 controller and MD720-3 • Check whether the used cable is a modem cable (serial standard cable) and not a null modem cable (cf. http://en.wikipedia.org/wiki/Null_modem)
8030	The routine for sending a SMS could not transfer the receiver number	• Check appropriate parameter on the inputs of the “com[FB154]” function block • Indicate parameters by using an apostrophe ’, not inverted commas “ • Always specify cellular telephone numbers in syntax +<country code><area/provider ><number> • The MD720-3 cannot receive gateway addresses (fax or mail sending) without “+” in front of it
8070	The message of the SMS could not be transferred	
8999	Whilst the function block executed the sending of a SMS, a time-out occurred	• Check connectivity between S7-1200 controller and MD720-3 • Check whether the used cable is a modem cable (serial standard cable) and not a null modem cable (cf. http://en.wikipedia.org/wiki/Null_modem)

Note Also use the Service&Support portal forum to solve problems.

http://www.siemens.com/forum-applications

Note If the support does not lead to the desired result it may be helpful to load the MD720-3 factory settings. For this purpose use a paper-clip. Press the SET button until the “C” LED lights up and then remove the paper-clip. Once booting has completed, the modem will assume the state as shown in Table 1-7 no. 1.

5 Reference

Table 5-1

No.	Document/Link
\1\	MD720-3 device handbook http://support.automation.siemens.com/WW/view/en/23117745
\2\	SIMATIC S7-1200 System Manual http://support.automation.siemens.com/WW/view/en/36932465
\3\	S7-200 based telecontrol solution with SMS http://support.automation.siemens.com/WW/view/en/21063345
\4\	S7-300 based telecontrol solution with SMS http://support.automation.siemens.com/WW/view/en/25545680

6 History

Table 6-1

Version	Date	Modification
V1.2	09.08.2011	New library version V1.2 is now adapted to STEP 7 V11. Some Default values of the library changed here in the documentation.
V1.1	01.11.2010	New library version V1.1: Problems with TC65T and TC35i solved, TC65T now as substitute device, Timeouts of all routines modified
V1.0	21.05.2010	First issue