

Kofax Communication Server

Technical Manual for TC/LINK-WM and TC/LINK-MD

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The KOFAX logo is rendered in a bold, blue, sans-serif typeface. The letters are thick and closely spaced, with a consistent weight throughout the word.

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Chapter 1

Preface

The Short Messaging Service (SMS) provided by GSM networks experiences an enormous and yet increasing popularity especially in Europe and Asia. Not just kids and teenagers use this service to exchange news and jokes with their friends; it becomes also increasingly accepted within the business world.

For organizations SMS can become a vital part of their business. Common uses of the Short Messaging Service are e.g. notifications and reminders for certain events, alerts for critical situations, information pull/push, OTA (over the air) configuration.

The breakthrough of the SMS market generates a new opportunity for Kofax to provide our customers an optimal solution allowing them to create new value-added services and business opportunities.

Short Messaging Service

SMS provides exchange of simple text messages (up to 160 characters). Messages are normally entered directly on the cellular device. Addressing is done by entering the telephone number of the recipient or by selecting entries from the directory available on more advanced cellular phones. A successfully transmitted message goes to the Short Messaging Service Center (SMSC) of the GSM operator.

The SMSC provides the store and forward services between the cellular phones and other providers. The quality of service and reliability of SMS is highly dependent on the SMSC. As cellular devices may be unreachable (switched off or not within the GSM network range), the SMSC is responsible for storing a message until the cellular device is online again. How long these messages are stored depends on the GSM operator.

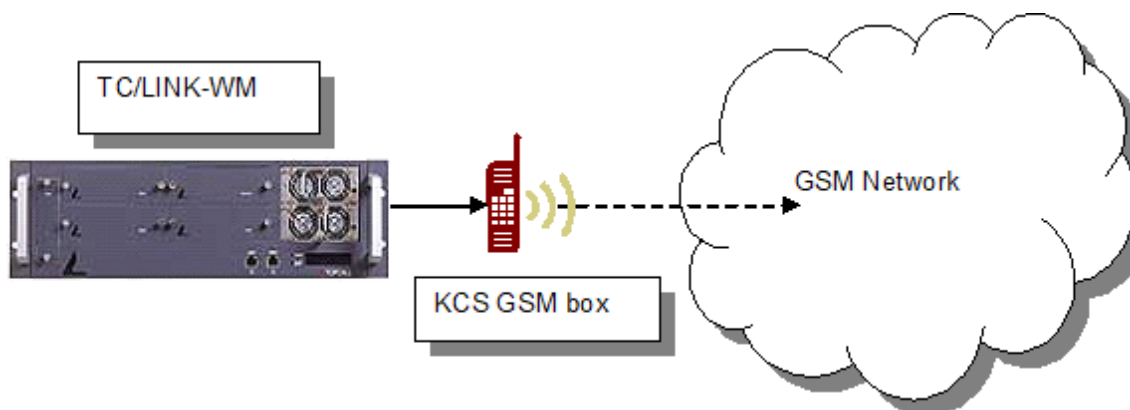
Note See <http://www.gsmworld.com> for a complete overview of all GSM operators.

Kofax Communication Server supports the following methods of sending SMS:

- TC/LINK-WM (Wireless Messaging Integration for GSM Interfaces)
- TC/LINK-MD (Mobile Data Link for Short Message Service Centers)

TC/LINK-WM

TC/LINK-WM connects via TCP/IP to a GSM-Interface. The GSM-Interface consists of an IP-Interface and a GSM-Modem. The GSM-Modem has to be equipped with a SIM card (as used in a mobile phone).



If an SMS arrives on the TC GSM box it is first saved on the SIM card. Because of security and of limited space on the SIM card for SMS the messages are transferred to temporary local files on the TC/Link PC immediately. The SIM card is always kept empty.

TC GSM Box

The TC GSM box provides the physical connection to the GSM network. Depending on the version an interface can provide up to four GSM channels. A channel provides one communication line to your GSM-Operator. Either multiple channels can be configured to the same operator to increase throughput or the channels can be independently configured for multiple GSM-Operators. For each channel a standard SIM card must be obtained from the GSM network operator.

If you want to send a SMS to a mobile of another operator, you have to check if a SMS roaming exists between these operators. It might happen that operators have no contract to send SMS vice versa. The best way is to install at least one GSM channel for each operator.

If for some reason the GSM-Interface is switched off, incoming messages stay on the operator's SMS-Center for some time. Mostly this time is one week (7 days) but it is fully dependent on the operator. If the GSM-Interface is switched on again it automatically receives all messages waiting in the queue.

The communication with the GSM-Modem is done via AT-Commands as described in the ETSI document GSM 07.05. The SMS are transmitted in a low-level binary mode (PDU mode).

TC/LINK-WM can be used with the following TC GSM boxes:

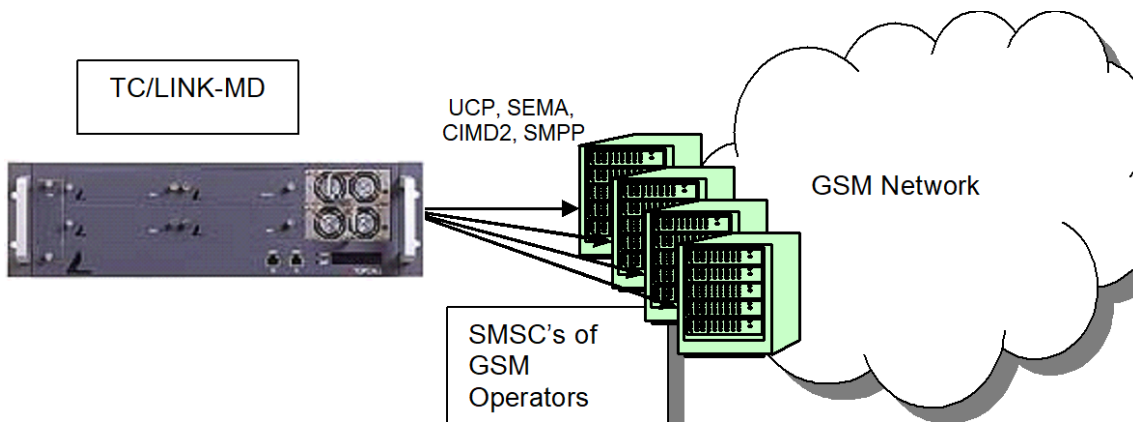
- TC Model360 (SMS Box)
The TC Model360 is a compact box based on the experiences with the TC GSM Box V2 but it supports also UMTS in addition to GMS. It consists of a Quectel UG95 modem and a LAN interface. It is supported since KCS 10.2.
- TC Model350 (GSM Box V2)
The TC Model350 is a compact box based on the experiences with the TC GSM Box V1 (TC08/TC37/TC55). It consists of a Siemens MC55 modem and a LAN interface.
- TC GSM Box V1 (discontinued)
The TC GSM Box V1 was available until 2005. This classic SMS solution is composed of three parts: TC08 (Box), TC37 (Falcom A1 or A2D modem), TC55 (LAN interface).
- TC Model305 GSM (discontinued)

The TC Model305 GSM is designed for 19" server racks. It can be equipped with two TC25 dual GSM interfaces, with each TC25 consisting of two Siemens MC55 modems and is therefore able to provide up to four GSM channels. Each GSM channel requires its own instance of TC/LINK-WM.

TC Model350 and TC Model305 support GSM 900/1800/1900 networks.

TC/LINK-MD

TC/LINK-MD connects to an SMS-Center via an Internet connection (TCP/IP) and exchanges Short Messages directly with the Service Center of the chosen GSM-Operator. No additional hardware is needed. You need a special access agreement (SMS-Center Large Account) with the GSM-Operator.



SMSC Interfaces

Your Link-Computer will need an Internet connection and a fixed IP address. The GSM operator will provide you with IP address and port number of his SMSC. Additionally you get a Short-ID and password that define your account at the SMSC.

As the behavior of Service Centers is largely dependent on the GSM operators who run them, not all SMS features might be provided by each operator.

KCS UCP

The first version of TC/LINK-MD was implemented for the UCP protocol of CMG (vendor of the SMSC of the same name). The UCP-50 and UCP-60 commands are supported.

For using this implementation you do not need any additional license.

Note This originally was called TOPCALL UCP, and is now renamed to KCS UCP.

TOPS Integration for UCP, SMPP, SEMA and CIMD2

TC/LINK-MD has integrated the “SMSC client .NET” of the company TOPS to provide connectivity with the additional SMS-Center protocols SMPP, SEMA and CIMD2. This library also supports the UCP protocol:

- SEMA OIS version 8.1 (SEMA Telecoms)
- CIMD2 version 1.2 (NOKIA)
- UCP version 2 (CMG Wireless Data Solutions)
- SMPP version 3.4 (SMPP Developers Forum)

For using this implementation you will need additional licenses for the TOPS library. Please specify the needed protocols when ordering TC/LINK-MD. Kofax will provide you with the needed TOPS SDK version and licenses. For testing you can use the “TOPS SMSC client .NET” with some restrictions without license.

SSL/TLS Security for UCP and SMPP

To enable SSL/TLS security when connecting to a SMS provider using TOPS "UCP" or "SMPP" protocols, set the following registry keys:

- HKLM\SOFTWARE\Wow6432Node\TOPCALL\TCLINKMD\Protocol\UseTLS
- HKLM\SOFTWARE\Wow6432Node\TOPCALL\TCLINKMD\Protocol\TlsProtocols

See [TOPS Integration Specific Settings](#).

Functionality

TC/LINK-MD provides the following functionality:

- Transport TCP/IP (to TC GSM box or SMS-Center)
- SMSC Protocols UCP, CIMD2, SEMA-OIS, SMPP (TC/LINK-MD)
- Multiple SMS Centers serviced simultaneously by a single TC/LINK-MD instance (TC/LINK-MD with TOPS Integration only)
- Reply address being sent with the message configurable for the Link or taken from the originator profile (TC/LINK-MD only)
- Both outbound and inbound messages
- Support of Delivery and Non-Delivery Notifications
- Latest Delivery Timeout - GSM Validity Period (KCS UCP and TOPS SMPP only)
- Inbound addressing
- Splitting of outbound messages that are longer than 160 characters
- Concatenating inbound messages that are longer than 160 characters into a single KCS message
- Flash messages (not saved but only displayed on the screen of the mobile)
- Outbound binary messages (Nokia Smart Messages: Ring tones, Pictures messages, Operator logos, VCards, VCalenders, Configuration messages) with external encoding

Chapter 2

Product Description

TC/LINK-WM and TC/LINK-MD enhance the KCS system with Short Messaging Services. The messaging functionality is always limited by the services offered by the GSM network operator.

Note In the following examples the used service-name is either “SMS” or “SMSC”. These are the default service names for TC/LINK-WM and TC/LINK-MD.

Sending from Mobile

To send from your mobile phone to any service of the KCS system the user simply creates a SMS message, as he would normally do. He types his text and chooses as recipient the number of the SIM-card used in the GSM-Interface (TC/LINK-WM) or the number (Short-ID) of the SMS-Center Large Account used by TC/LINK-MD.

This message goes to the default recipient of the TC/LINK-WM (MD) since the user did not specify a specific recipient. This default recipient can be for example a KCS user using TCfW with distributor mode on (default: postmaster; configurable in registry: Protocol\In\DefRecipient and \DefRecipientService).

However the user can specify one or more recipients as well. He simply types at the top of the text:

```
#recipient
```

After that he writes the text to be sent.

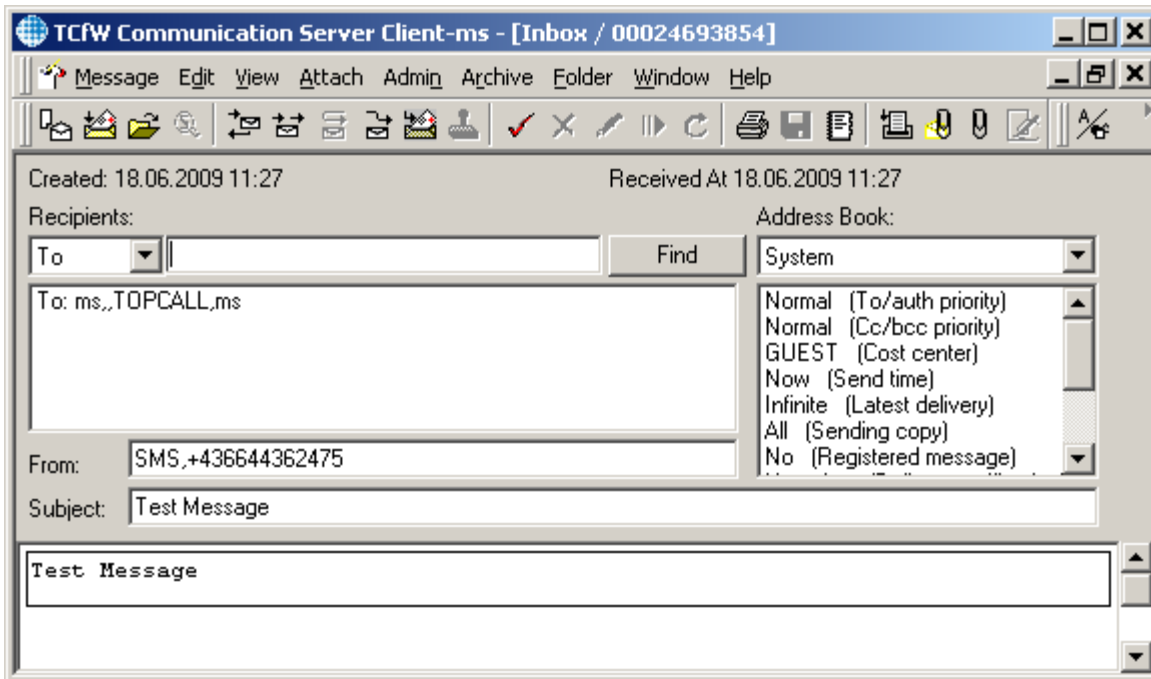
Note

- Since many mobiles do not support a return-key you can use blank instead of return, both works!
- Messages without recipient are **always** sent to the default recipient. Therefore a reply of a message has to be done by entering the originator manually!

Example:

```
#MS Test Message
```

This SMS will generate the following message in TCfW:



As you can see the first characters of the text body or the first line is chosen for the subject in the mail system. If the text body or first line has more characters than 128 just the first 128 are chosen for the subject (configurable in registry: Protocol\In\SubjectLength).

Example:

```
#MS Meeting
Please remember the meeting at 11:00 am on Monday in the conference room
```

This will lead to a message for MS with the subject "Meeting" and the text body "Please remember the meeting at 11:00 am on Monday in the conference room".

Instead of typing in "#" the user can use "TO:" at the beginning of the message, e.g. "TO: MS" is the same as "#MS". The recipient tokens (like "#", "TO:", "CC:", "BCC:") are configurable (registry: Protocol\In\ToChar, \TO, \CC, \BCC) and have to be at the beginning of the message.

Of course you can configure KCS recipients 0 to 9 and A to Z pointing to other addresses and can use them for address routing.

Example: 0 is configured in the system address book as FAX#6613321

```
#0 Tom is faxing from a mobile...
```

You send a fax to the configured number.

Examples addressing via service and number:

```
#FAX#123467 This is a Fax message
#TLX#1234567#answerback This is a telex message
#SMTP#Marketing@kofax.com This is an Email
```

Examples addressing via KCS user or address:

```
#TM Hi Tom, this is a message...  
#address1 this is a message
```

Of course you can specify more recipients with different delivery types. Separate multiple recipients of the same type by a comma (,) character:

```
To: TM, FAX#66133875  
Cc: SMS#06641234567  
Bcc: BM, SMTP#someone@kofax.com, SMTP#marketing@kofax.com
```

This is a message to more recipients.

Note

- Services (FAX, SMTP...) are case sensitive! Thus sending to fax#66133875 will NOT send a fax since the service to send faxes is called FAX!
- The maximum size including recipient information is limited to the 160 characters SMS limit.
- If a recipient contains a blank or a “,” it must be enclosed by double quotes (“”).
- Blanks after keywords (e.g. “#”, “TO:”, “,”,...) are ignored.

Advanced Format for Recipient Address

TC/LINK-WM (MD) is fully compatible to TC/LINK addressing syntax. However mostly it will not be useful to specify recipients this way, since it needs too many characters to be typed in. Most mobile phones do not have an easy and fast way to type characters!

The general way to specify a recipient is

TO: “[fullname#][service#]number[#answerback]”

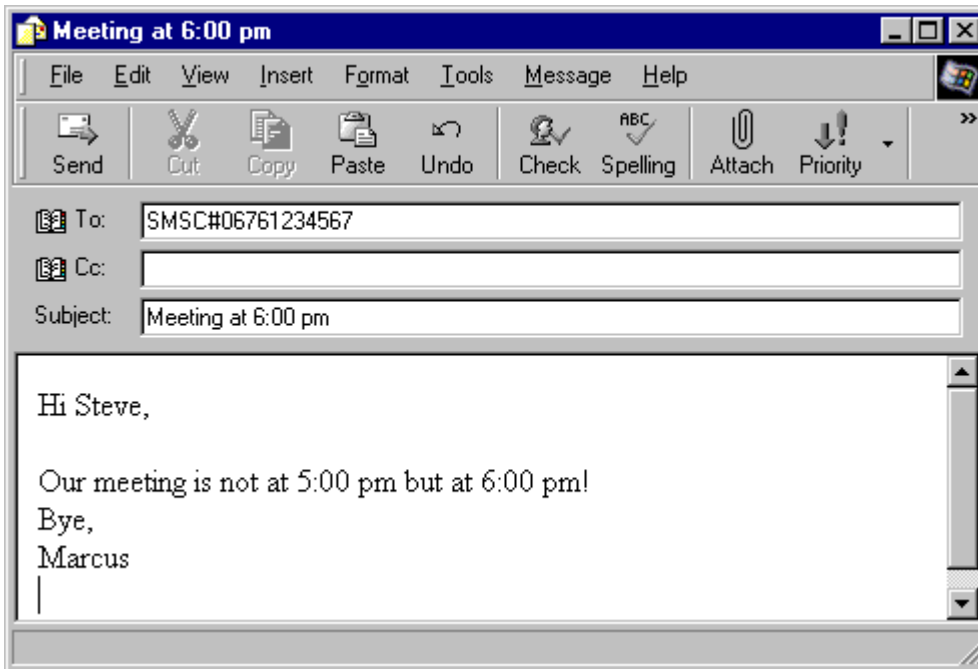
Note

- Items are checked from left to right. So if you specify 2 Items, but no valid service name, they will be interpreted as full name and number, not number and answerback.
- The service can be omitted; in this case, the default service as defined on TC/LINK-MD will be used (registry: Protocol\In\DefRecipientService).

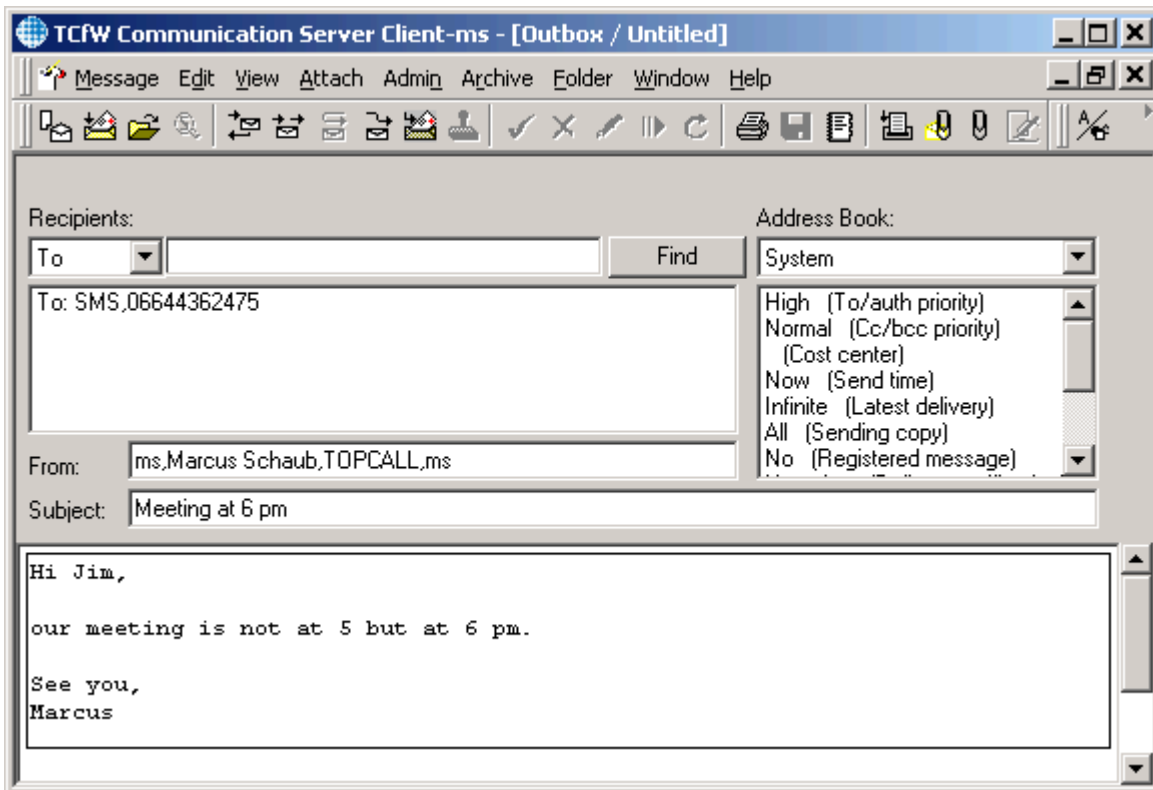
Sending to Mobile

Via TC/LINK-WM (MD) the user can send short messages from any KCS supported mail system to mobile phones supporting SMS. Here Microsoft Outlook Express is chosen as example.

To send a Short message to a mobile recipient simply open your new message mask as usual and type in the recipient field “SMSC#” and the mobile phone number. SMSC is the default service used by TC/LINK-MD (configurable during setup or in the registry: Protocol\OwnService). The default service for TC/LINK-WM would be SMS.



From TCfW a message would be sent like this:



The mobile recipient gets a message like this:

```
FROM:ms Meeting at 6 pm
Hi Jim,
our meeting is not at 5 but at 6 pm.
See you,
Marcus
```

You see the message text the SMS recipient gets is composed of originator information first, subject second and message body at last.

Note

- Any attachments sent to an SMS recipient are ignored (see restrictions) and if the message text is longer than 160 characters the message will be truncated (depends on configuration, registry Protocol\Out\MaxLengthSMS and \MaxNumberSMS).
- The originator GSM number shown by the mobile phone is configurable for TC/LINK-MD (during setup and registry: Protocol\Out\ReplyAddressDefault) and also per KCS user: If the mobile message sending user has an address as defined by the registry key Protocol\Out\ReplyAddressService, the originating GSM number is taken from his user profile.

Instead of typing always the SMS Service and the mobile phone number naturally you can create a recipient in your mail system or in TCFW:

Ac	No	Service	Number:
X	1	SMSC	+436763614058.

Notifications

This section describes message notifications.

Delivery and Non-delivery Notifications to Mobile Phone

Delivery notifications are delivered to the mobile phone as normal messages; by default only non-delivery notifications are sent to mobile phones. See TC/LINK manual for further information.

Delivery and Non-delivery Notifications to KCS

It is configurable if notifications shall be generated on delivery to the SMS-Center or at delivery at the mobile device. This is done by specifying during setup “Set Entry At Next Node” No or Yes, or later in the registry Topcall\NotifMail 0 or 1. No or 0 means that the message is regarded as delivered when successfully put to the SMSC. Yes or 1 means that a notification is sent back to KCS when the SMSC has delivered the message to the mobile; this is also the default setting.

End-to-end notifications depend on the capabilities of the target GSM network. TC/LINK-MD relies on status notifications being received from the target network to generate del/non-del notifications. If notifications are requested and the target network does not send any status notification, a message may remain unterminated until any KCS latest delivery timeout terminates it.

If messages are passed between GSM networks (roaming, interworking) status notifications may be generated by the SMS hosts and not by the receiving device.

Notifications are always **delivery** notifications and never **read** notifications.

Flash Messages

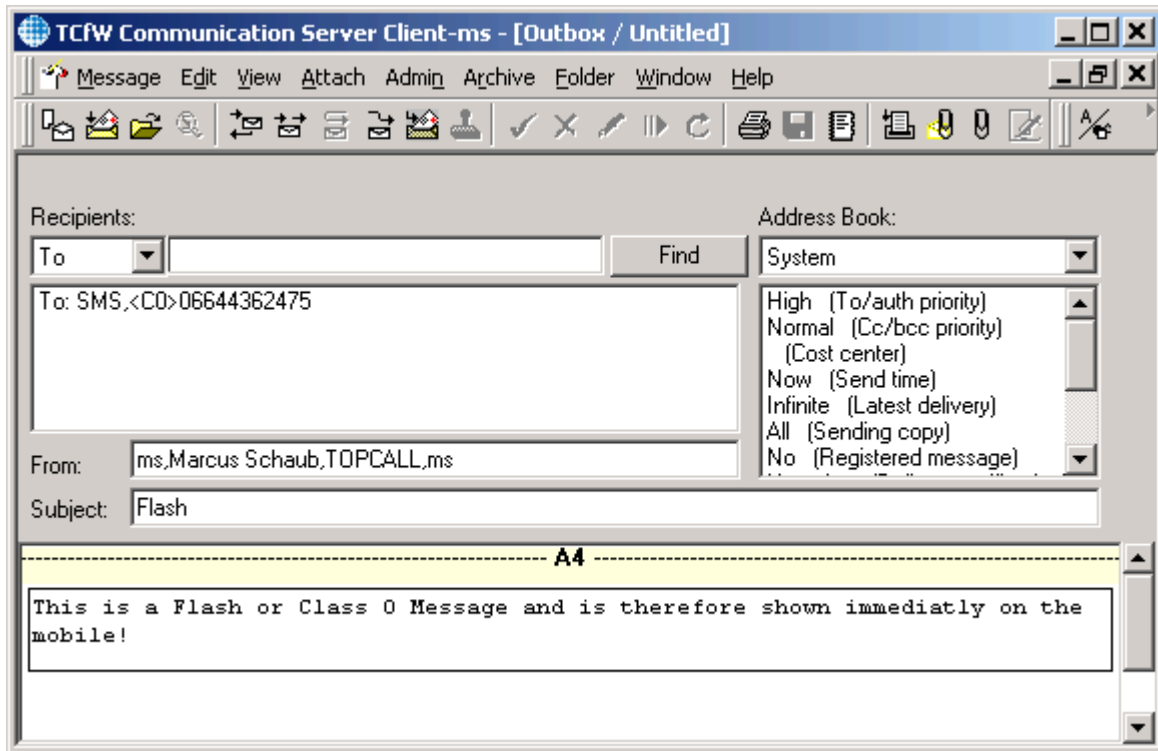
Flash Messages are messages that are shown on the mobile immediately and that are not saved. Only the last received Flash Message is shown on the mobile, previously sent messages are lost. These types of message can be used to distribute information that become quickly out of date or for advertising-like messages.

The syntax to send Flash Messages (also called Class 0 Messages) is to specify the parameter “C0” as send option between angle brackets before the mobile number.

Example:

```
<C0>06761234567
```

Sending a Flash Message from TCfW would look like this:



Configuring a Flash Message Service

For the convenience of the users you might want to configure an own service for SMS Flash Messages. Simply define a new service (e.g. SMSF) and define as prefix the queue of the Mobile Data Link with the send option for Flash Messages <C0>. So typically the prefix would be "TCLMDQI:<C0>".

Services

Service: Type:

Description: Prefix:

Image Restricted Text
 Text Binary
 OCR Conversion

Service	Description	Document Class	Prefix	Address
SCX4002	Sapconnect X400	RTIB	TCSCQ24:X	Free Format
SMS	Short Message Service	RT	TCLW/MQI:	Free Format
SMS2	Short Message Service	RT	TCLW/M2QI:	Free Format
SMSC	SMS-Center Link Service	RT	TCLMDQI:	Free Format
SMSCOUT	Abbreviated Numbers	T		Free Format
SSMF	SMS Flash Message	T	TCLMDQI:<	Free Format
SMTP	Internet Address	RTIB	TCLSMQ0:	Free Format
SMTPCTV	TCImgio testservice	RTIB	LINKZUF:	Free Format
SMTPIN	SMTP inbound queue	RTIB	postmaster:	TOPCALL
SMTPJAP	Internet Address	RTIB	TCLSMQ1:	Free Format
SMTPMA	Internet Address	RT	TCLSM2Q3:	Free Format

With a so defined service the user can send Flash Messages by addressing with service and number without specifying any send options.

Example of addressing from TCfW:

```
SMSF, 06761234567
```

Routing (TC/LINK-MD with TOPS Integration only)

When using the TOPS Integration you can use one single TC/LINK-MD instance to connect to several GSM Operators. To send a message using a particular connection you have to use following syntax:

```
SMSC, <PX>06761234567
```

Where <PX> defines which operator will be used for sending the message. The X stands for the operator number of the configuration (registry setting "...Protocol\OperatorX\Name"). By default "Operator0" is used.

If you have connections to more than one GSM Operator, you can use the KCS Arr99 to define automatic routing. Depending on the prefix of the number the user is sending to, a different connection to a GSM Operator can be used.

Example:

Let's say we have three GSM Operators: A1, Tmobile, One. The first two use the SMPP protocol and the last UCP. One single instance of TC/LINK-MD can be configured to support these operators. However, this implies that the general TC/LINK-MD configuration has to be the same.

The configuration (each operator provides two SMS-Center addresses, A1 provides four) could look as follows:

<pre> ...TCLINKMD\Protocol\Operator0\Name = A1 ...TCLINKMD\Protocol\Operator0\ShortId = 4711 ...TCLINKMD\Protocol\Operator0\Password = pwd ...TCLINKMD\Protocol\Operator0\Protocol = SMPP ...TCLINKMD\Protocol\Operator0\AddressIn1 = 1.2.3.4:234 ...TCLINKMD\Protocol\Operator0\AddressIn2 = 1.2.3.5:234 ...TCLINKMD\Protocol\Operator0\AddressOut1 = 1.2.3.6:234 ...TCLINKMD\Protocol\Operator0\AddressOut2 = 1.2.3.7:234 </pre>
<pre> ...TCLINKMD\Protocol\Operator1\Name = Tmobile ...TCLINKMD\Protocol\Operator1\ShortId = 2345 ...TCLINKMD\Protocol\Operator1\Password = lkj ...TCLINKMD\Protocol\Operator1\Protocol = SMPP ...TCLINKMD\Protocol\Operator1\AddressIn1 = 1.2.9.6:654 ...TCLINKMD\Protocol\Operator1\AddressOut1 = 1.2.9.7:654 </pre>
<pre> ...TCLINKMD\Protocol\Operator2\Name = One ...TCLINKMD\Protocol\Operator2\ShortId = 0815 ...TCLINKMD\Protocol\Operator2\Password = sdf ...TCLINKMD\Protocol\Operator2\Protocol = UCP ...TCLINKMD\Protocol\Operator2\AddressIn1 = 1.2.4.5:765 ...TCLINKMD\Protocol\Operator2\AddressOut1 = 1.2.4.6:765 </pre>

The user has the possibility to send either to only a plain SMS-service and number, e.g. "SMS, 0664123456", or he uses a send option defining a special GSM-operator: "SMS, <P0>0664123456"; additionally it is possible to define a service for each operator: "SMS-A1, 0664123456" would be transformed to the previous example by KCS.

In the rr99 file on KCS the operator has to be chosen if he is not addressed explicitly. So there are transformations of the following kind:

SMS, 0664123456	- >	<P0>*43664123456
SMS, <C0>0699123456	- >	<C0P2>*43699123456
SMS, *43676123456	- >	<P1>*43676123456

The second example uses additional the send option C0 for Class0 or Flash Messages. Additional send options are kept as they are. As international prefix "*" is used instead of "+" as the "+" is interpreted differently by KCS and the rr99 file.

The Arr99 file would have entries as the following:

```

**NORMALIZE
TCLMDQI:*~, TCLMDQI:*~
    
```

```
TCLMDQI:00~, TCLMDQI:*~
TCLMDQI:0~, TCLMDQI:*43~
**ROUTE
TCLMDQI:*43664~, TCLMDQI:<P0>*43664~
TCLMDQI:*43676~, TCLMDQI:<P1>*43676~
TCLMDQI:*43699~, TCLMDQI:<P2>*43699~
TCLMDQI:*~, TCLMDQI:<P0>*~
```

Only numbers of the SMSC service addressing the TCLMDQI queue are handled. In the “NORMALIZE” section the numbers are transformed to the international format (e.g. “*43664123456”), in the “ROUTE” section the send options are added according to the operator prefixes of the numbers (e.g., “<P0>+43664123456”).

TC/LINK-MD interprets the send option and chooses the matching GSM-operator and its connection.

Alternative Routing

It is also possible to configure the Arr99 for alternative routing. If the sending via one connection/operator fails, a alternative operator can be chosen. Taking again the three operators described above you could configure the following in the Arr99 file:

```
**NORMALIZE
TCLMDQI:*~, TCLMDQI:*~
TCLMDQI:00~, TCLMDQI:*~
TCLMDQI:0~, TCLMDQI:*43~
**ROUTE
TCLMDQI:*43664~, TCLMDQI:<P0>+43664~\TCLMDQI:<P1>*43664~
TCLMDQI:*43676~, TCLMDQI:<P1>*43676~\TCLMDQI:<P0>*43676~
TCLMDQI:*43699~, TCLMDQI:<P2>*43699~\TCLMDQI:<P0>*43699~
TCLMDQI:*~, TCLMDQI:<P0>*~\TCLMDQI:<P1>*~
```

If sending to Operator0 fails, the SMS is sent via Operator1 and so on. However this makes it necessary that the send order is terminated negatively. This can be controlled by the TOPS protocol specific registry keys “...Protocol\OperatorX\<Protocol>TempDelayReturns”. See the section on the registry settings.

Binary Messages

TC/LINK-MD and TC/LINK-WM support sending of externally created binary SMS. Examples for possible message types are especially the “Smart Messages” defined by Nokia (“<http://www.forum.nokia.com>”), e.g.:

- Ring tones
- Pictures messages
- Operator logos
- VCards
- VCalenders
- Configuration messages

Possible message types are defined in the ETSI specification GSM 03.40; the GSM parameter that freely can be defined within the KCS message is called TP-User-Data (TP-UD) in the GSM specification. This parameter normally only consists of the message text. GSM 03.40 specifies additionally the possibility to define a User Data Header (UDH) within this parameter, followed by the actual content of the SMS. Therefore KCS lets you define the User Data Header (<UDH>) and the content (<BODY>) of the SMS.

For restrictions regarding Binary Messages please see the section on restrictions.

Addressing

A Binary SMS is defined by the send option <B1>. You have to put this send option before the number of the recipient.

Addressing example for TC/LINK-MD

```
SMSC,<B1>06641234567
```

Coding

The parameters for the Binary SMS have to be put to the text part of the KCS message using the following structure:

```
<SMS>
  <CODING>...</CODING>
  <UDH>...</UDH>
  <BODY>...</BODY>
</SMS>
```

Parameters and their meaning:

<CODING>	<p>Defines the coding of the KCS <BODY> part and the setting of the GSM 03.40 TP-Data-Coding-Scheme (TP-DCS) parameter. Possible values:</p> <p>TEXT: The <BODY> part consists of plain text. The TP-DCS parameter will be set to 7bit (Default Alphabet) or 16bit (UCS2) coding, as would be a text SMS.</p> <p>HEX: The <BODY> part consists of text already coded according to GSM requirement, either 7bit (Default Alphabet) or 16bit (UCS2), The TP-DCS parameter will be set accordingly. Each byte is represented by two hexadecimal characters ranging from "0"-“F”. Only TC/LINK-WM!</p> <p>BINARY: The <BODY> part consists of binary data, where each byte is represented by two hexadecimal characters ranging from "0"-“F”. The TP-DCS parameter is set to 8bit (Binary Data) coding.</p> <p>PDU: The <BODY> part consists of the PDU string as used for transmission between mobile devices and SMS-Centers. See section “PDU Format” below.</p>
<UDH>	<p>The User Data Header of the SMS as hexadecimal string, where each byte is represented by two hexadecimal characters ranging from "0"-“F”.</p>
<BODY>	<p>The content of the SMS (without the User Data Header), represented depending on the <CODING> setting described above.</p>

Examples

The following example SMS messages are taken from the Nokia “Smart Messing FAQ Version 2.0”. You can find this document at “<http://www.forum.nokia.com>”.

Ring tone

```
<SMS>
  <CODING>BINARY</CODING>
  <UDH>06050415811581</UDH>
  <BODY>024a3a51d195cdd004001b2055059
  0610560558550548540820849900000</BODY>
```



```
DTEND:20041013T120000
END:VEVENT
END:VCALENDAR</BODY>
</SMS>
```

Long VCalender Part 1

```
<SMS>
  <CODING>TEXT</CODING>
  <UDH>0B050423F500000003020201</UDH>
  <BODY>BEGIN:VCALENDAR
VERSION:1.0
BEGIN:VEVENT
DESCRIPTION:Kofax looooooong meeting in HQ Vienna
DTSTART:20041013T100000
DTEND:20041013T120000
END:VEVE</BODY>
</SMS>
```

Long VCalender Part 2

```
<SMS>
  <CODING>TEXT</CODING>
  <UDH>0B050423F500000003020202</UDH>
  <BODY>NT
END:VCALENDAR</BODY>
</SMS>
```

Binary SMS Sent via TC/LINK-XML

In order to provide a seamless integration of Binary SMS support via TC/LINK-XML, the default transformation style sheet ("TCXMLIn.xslt") was extended.

It is not possible to put the Binary SMS content to the <TXT> part of the TC/XML message (the KCS XML parser does not accept the newly defined tags). Therefore a new tag was defined for transparently supporting XML tags that should not be interpreted by KCS (but by TC/LINK-MD or WM in this case): <EMBEDDEDXML-TXT>.

Here the example for the Ring-tone again as TC/XML message:

```
<?xml version="1.0" encoding="UTF-8"?>
<MESSAGE xmlns="http://www.topcall.com/XMLSchema/2002/tc/xml">
  <SUBJECT>Ring Tone</SUBJECT>
  <FROM>
    <SERVICE>TOPCALL</SERVICE>
    <NUMBER>MS</NUMBER>
  </FROM>
  <TO>
    <SERVICE>SMSC</SERVICE>
    <NUMBER>&lt;B1&gt;06641234567</NUMBER>
    <NF>ALL</NF>
  </TO>
  <EMBEDDEDXML-TXT>
    <SMS>
      <CODING>BINARY</CODING>
      <UDH>06050415811581</UDH>
      <BODY>024a3a51d195cdd004001b2055059
0610560558550548540820849900000</BODY>
    </SMS>
  </EMBEDDEDXML-TXT>
</MESSAGE>
```

PDU Format

TC/LINK-WM supports transparent sending and receiving of PDU strings (the binary string that is transferred between mobile device and SMS-Center, as defined in GSM 03.40).

Outgoing SMS (KCS to Mobile)

Messages from KCS to Mobile in PDU format have to include the binary message tag <B1> in the recipient address. The <CODING> tag has to be set to "PDU" and the <BINARY> tag has to consist of the hexadecimal PDU string.

Addressing Example:

```
SMS,<B1>06641234
```

Binary SMS – PDU example for outgoing SMS:

```
<SMS>
  <CODING>PDU</CODING>
  <BODY>00210008816046214300003B54747A0E4ACF416137A88C0FB7E1EC32084AAC82DA
E5F93C7C2EBB40537A985E9F83A465F85B4E07A5E72079395E2FCFE965B20B</BODY>
</SMS>
```

When sending the SMS via TC/LINK-XML, the <EMBEDDEDXML-TXT> tag has to be used.

Binary SMS – PDU example as TC/XML message:

```
<?xml version="1.0" encoding="UTF-8"?>
<MESSAGE xmlns="http://www.topcall.com/XMLSchema/2002/tc/xml">
  <SUBJECT>A PDU Message</SUBJECT>
  <FROM>
    <SERVICE>TOPCALL</SERVICE>
    <NUMBER>MS</NUMBER>
  </FROM>
  <TO>
    <SERVICE>SMS</SERVICE>
    <NUMBER>&lt;B1&gt;06641234</NUMBER>
    <NF>ALL</NF>
  </TO>
  <EMBEDDEDXML-TXT>
    <SMS>
      <CODING>PDU</CODING>
      <BODY>00210008816046214300003B54747A0E4ACF416137A88C0FB7E1EC32084AAC82DA
E5F93C7C2EBB40537A985E9F83A465F85B4E07A5E72079395E2FCFE965B20B</BODY>
    </SMS>
  </EMBEDDEDXML-TXT>
</MESSAGE>
```

Note

- The example PDU will not work, as an invalid recipient number is specified.
- The KCS recipient number is ignored; the GSM destination number is already part of the PDU. Only for matching GSM status reports it is used and has to be set (see below).
- If the TC/LINK configuration is set to NotifMail = 1 (request a delivery configuration), the PDU has also to be set to request a GSM status report; additionally the PDU recipient number and the KCS recipient number have to be set to the same value – if not, the TCROSS send order will remain open.
- KCS parameters and TC/LINK configuration like Subject, Originator, LatestDelivery, ... are ignored, as they are already set in the PDU.
- Only one SMS PDU string can be sent per KCS message; long SMS that are sent concatenated have to be sent as one PDU per KCS message.

Incoming SMS (Mobile to KCS)

The PDU mode for incoming SMS has to be configured per-instance of TC/LINK-WM by setting the registry parameter “Coding” = “PDU-NAT”.

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKWM\Protocol\In

Coding	STRING	""	<p>Coding type how TC/LINK-WM delivers SMS to TCROSS.</p> <p>“”: The default (void) decodes the received message and creates the KCS message accordingly</p> <p>PDU-NAT: The PDU string (as received by the modem of the GsmBox) is put to the text part of the KCS message; additionally the text of the PDU is interpreted for subject and recipient</p>
--------	--------	----	--

Binary SMS – PDU example for incoming SMS:

```
0791534850020200440B856046022533F23900709002311581809A06050423F50000C2
E231E9D459874166D1490C4A1B0A6B513A4D3E9DBA980BD650088BC7A453672D5A8B4E6A4341
2C4E87D224949A7C3A75D4277418643241ED72999E769F1B0A22754A0D4AA93A190C468BC162
336A0C0683C1600D05915A74127532188C1683C566D4980C0683C11A8AA293A8B316AD4527B5
A1283A893AEB30C82C3A894129
```

Binary SMS – PDU example for incoming SMS, forwarded to TC/LINK-XML:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<MESSAGE xmlns="http://www.topcall.com/XMLSchema/2002/tc/xml">
...
  <FROM>
    ...
    <SERVICE>SMS</SERVICE>
    <NUMBER>+436764120083</NUMBER>
  </FROM>
  <TO>
    ...
    <SERVICE>TCFI</SERVICE>
    <NUMBER>ms</NUMBER>
  </TO>
  <TXT>059134760612040C91347646210038000013092614171803046E9B3A96B86E5E3FA1C34
1DA3C37531885A9ED315413728ED1EBFDB69F71904255641EDF27C1E3E975D</TXT>
</MESSAGE>
```


Note The subject and the recipient of the KCS message are taken from the SMS text. For binary SMS the subject will not be meaningful.

Recommended TC/LINK-XML (FI) setting:

```
Topcall\AllowLongLinesToMail = 1
```

If you do not use this setting, the binary string is split and your application has to handle this.

Chapter 3

Performance

This section provides information about the performances of TC/LINK-WM and TC/LINK-MD.

TC/LINK-WM

Sending an SMS via TC/LINK-WM takes about three seconds. This time is the average time the SMS-Center needs to confirm the arrival of the message. Depending on the GSM operator this time may vary due to restrictions the operator establishes or due to congestion of the network and might also lead to answer times of ten seconds and more.

So the message throughput can easily vary from about 360 to 1200 messages per hour per GSM channel. Multiple GSM channels (as available with the Model305) will multiply this throughput.

Resources of the TC/LINK-WM computer will be nearly negligible. However, incoming messages (also end-to-end notifications - if requested - are incoming messages) will slow down the performance.

TC/LINK-MD

The speed for transmission of the messages between the network and TC/LINK-MD largely depends on the available bandwidth for the Internet access, on the respond time of the SMSC and on how many messages per second the SMSC account accepts.

Let us say the response time of the SMSC is 200 ms and we have a 64kBit per second Internet access line. An SMS of 160 characters will never be larger than 5kBit (including lots of protocol overhead), that will take less than 100 ms. That means that three messages should be easily possible in one second (if the SMSC account accepts them), which leads to an overall performance of 10800 messages per hour.

The overall performance also depends on the load of the SMSC and the GSM operator network. The overall service level can only be as good as the service level of the component (Internet, SMSC, GSM operator) with the least Quality.

Chapter 4

Requirements

This section describes the software and hardware requirements.

Package Versions

TC/LP: Version 2.04.00 or higher (2.09.05 for TC/LINK-MD TOPS Integration)

TC/SP: Version 7.46.00 or higher. Earlier TC/SP versions do not support notifications from mobile devices.

TOPS SDK: The following KCS (TC/LP) releases need the mentioned TOPS SDK versions. It is mandatory to use exactly the correlating version.

TC/LP / KCS Version	TOPS SDK Version
2.09.05 Alpha	2.1.154 (SMSC Relay ActiveX)
2.10.05	2.1.154
2.14.03, 2.16.00, 2.18.00	2.2.131
2.20.00	2.3.69
2.24.00 – 2.34.00 (KCS 8.2)	2.3.187
KCS 9.0 (LP 2.36.02), KCS 9.1 (SP 7.90.04), KCS 9.1.1	2.3.198
KCS 9.2	5.0.174 (SMSC client .NET)
KCS 10.0, KCS 10.0.1	6.0.29 (SMSC client .NET)
KCS 10.1	7.0.16 (SMSC client .NET)
KCS 10.1.1	7.0.106 (SMSC client .NET)

Attention:

- Since KCS 9.2 you need a new TOPS SDK license for SMSC client .NET. If you update an existing system, request the new license from Professional Services.
- Use the TOPS SDK version according to above table, other TOPS SDK versions (also newer ones) will lead to errors.
- Microsoft .Net 2.0 or higher is required before the TOPS SMSC client .NET is installed.
- The TOPS SDK has to be installed separately. Since KCS 9.2 the appropriate version and documentation is on the KCS release image, in the 3rd party folder. For earlier KCS versions contact Technical Support.

Note Since version 7.90.xx, the former link package and server package were merged into Kofax Communication Server (KCS). Since KCS 9.1.1 the old version number (SP 7.xx.xx) is obsolete.

Licenses

Each TC/LINK-WM or TC/LINK-MD instance needs an own license.

For TC/LINK-WM you need a SMS channel license. One SMS channel (TC/LINK-WM instance) is required per SIM-Card – that are up to 4 when using Model305.

TC/LINK-MD needs the TC/LINK-MD license. When using the UCP protocol, the recommended way is using KCS UCP – you do not need to install anything additionally. For TC/LINK-MD using *TOPS Integration for UCP, SMPP, SEMA and CIMD2* you need to install the TOPS SDK and need an additional license for the requested protocol.

Note You can use the same license key for TOPS SDK version 7.x which you have used for TOPS SDK version 6.x.

Please state what protocol you want to use when ordering TC/LINK-MD. Kofax will provide the necessary licenses.

KCS Server

Please check if the KCS server version you are using is supported. Please refer to the TC/LINK manual for information about the minimum required KCS server version and about restrictions for specific KCS server versions.

You also have to know the **KCS server name**, the **transport type** (RPC or Native) and the **link type** (e.g. TCP/IP) to connect to the KCS server.

TC GSM Box (TC/LINK-WM)

- Each TC GSM box requires a standard SIM card, obtainable directly from the GSM operator. The GSM network has to support the 900 or the 1800 frequencies. For GSM 1800 you need TC37.10 (TC55 with Falcom A2D Modem)
- The TC55 TC GSM box requires a 10Mbit Ethernet connection (10baseT or RJ45) for LAN connection and the main power outlet (100-230V 50/60 Hz)

SMSC Interface (TC/LINK-MD)

The customer needs an access agreement (an SMS-Center Large Account, identified by a Short-ID) with a GSM operator to connect to his SMSC. The SMSC has to support one of the protocols UCP, SMPP,

CIMD2 or SEMA. The access agreement will regulate the amount of Short Messages the customer is allowed to send.

The Link-Computer needs an Internet connection. The GSM operator will provide you with IP address and port number of his SMSC. The IP-connection will be established from the Link-Computer.

Typically the GSM operator will ask for the IP address of the Link-Computer, to configure his network to accept only connections from these addresses. The Link-Computer will usually be located behind the firewall and gateway of a corporate network. In this case the GSM operator has to be asked to accept connections from the IP address the **Link-Computer appears to in the public internet**, which will be the outgoing public address of the internet gateway.

As the behavior of Service Centers is largely dependent on the GSM operators who run them, not all SMS features might be provided by each operator.

With the access agreement you should get (at least) the following information (see also the protocol specific configuration description):

- ShortID (also called UserID, SystemID, Large Account) and password
- SMS-Center address(es): IP and port-number
- SMPP protocol only: System-Type and Bind-Mode

Chapter 5

Installation

This section describes the installation.

Installing the TC GSM Box (TC/LINK-WM)

The TC GSM box is directly connected to the TCP/IP network. It is necessary to configure the IP parameters (IP-address, subnet mask and default gateway).

Configuration depends on the used type of GSM box. Please see the appropriate manual of the TC GSM box you are using.

Common Installation for all TC/LINKs

Please refer to the TC/LINK manual to get information about general installation instructions. This manual only describes the additional TC/LINK-WM (MD) specific installation steps.

Creating the KCS Link User

The default name for the **KCS LINK user name** is "TCLINK". With Kofax Communication Server version 7.22.xx and higher, this user is automatically created during initial KCS server installation with **password** "TCLINK". Please refer to *TC/LINK Technical Manual* for detailed information.

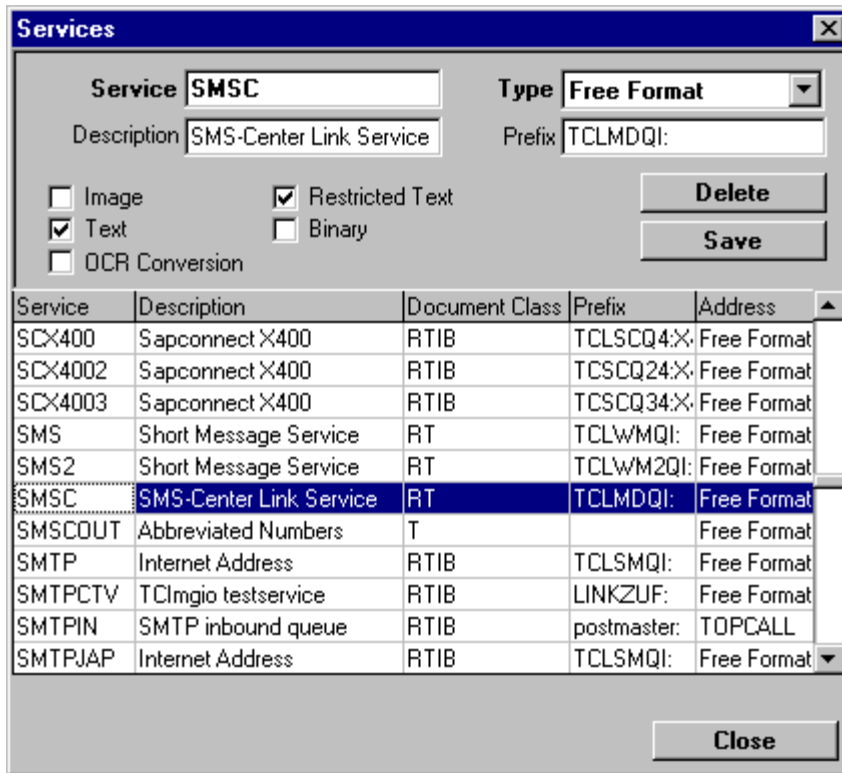
Creating KCS Dependencies

The KCS dependencies can be created automatically when TC/LINK starts. Please refer to the TC/LINK manual for detailed information. If you disable this feature, you have to create the following items manually on the KCS server:

SMS or SMSC Service:

The name of the service is not checked by TC/LINK if automatic creation is disabled, any name can be specified. If you do not want to use a service, the FREE service may be used to send directly to the link queue.

Address type = FREE



Prefix = "TCLWMQI:" (for queue TCLWMQ and format TCI the queue user TCLWMQI is used)

Prefix = "TCLMDQI:" (for queue TCLMDQ and format TCI the queue user TCLMDQI is used)

Run Setup

Now the **setup checklist** should be filled out completely and all preparations should be made. You can start with the TC/LINK installation.

- Log in to Windows with the TCDC user if the document converter is used on this server by other links.
- Start the Kofax Communication Server setup. Use "SETUP /?" to display optional command line options.
- From the Links group, select TC/LINK-WM or TC/LINK-MD. Click Install.

Please refer to the TC/LINK manual for information about the general part of the installation.

Easy / Advanced setup:

For most cases easy installation should handle all problems, however you should use advanced setup for more sophisticated solutions. The TC/LINK-WM (MD) specific setup-screens are also shown during "Easy Setup".

For the settings of the general TC/LINK, the differences are described in the TC/LINK manual.

Notes for the installation of general part of link:

The document converter, Postscript or PCL5 conversion are not used by TC/LINK-WM (MD). It can be disabled if no other links on the same server are using them.

Please refer to the *TC/LINK Technical Manual* for detailed information about the general parameters of TC/LINK.

TOPS Library Installation (TC/LINK-MD with TOPS-Integration)

When using the TOPS-Integration you have to install the TOPS SMSC client .NET. Regarding version and license please see the sections [Package Versions](#) and [Licenses](#).

Update - Changed Registry Keys

When updating from TOPS SMSC Relay ActiveX (Version 2.x) to SMSC client .NET (Version 5.x), necessary for KCS 9.2 and later versions, the following parameters of TC/LINK-MD for TOPS have changed:

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol

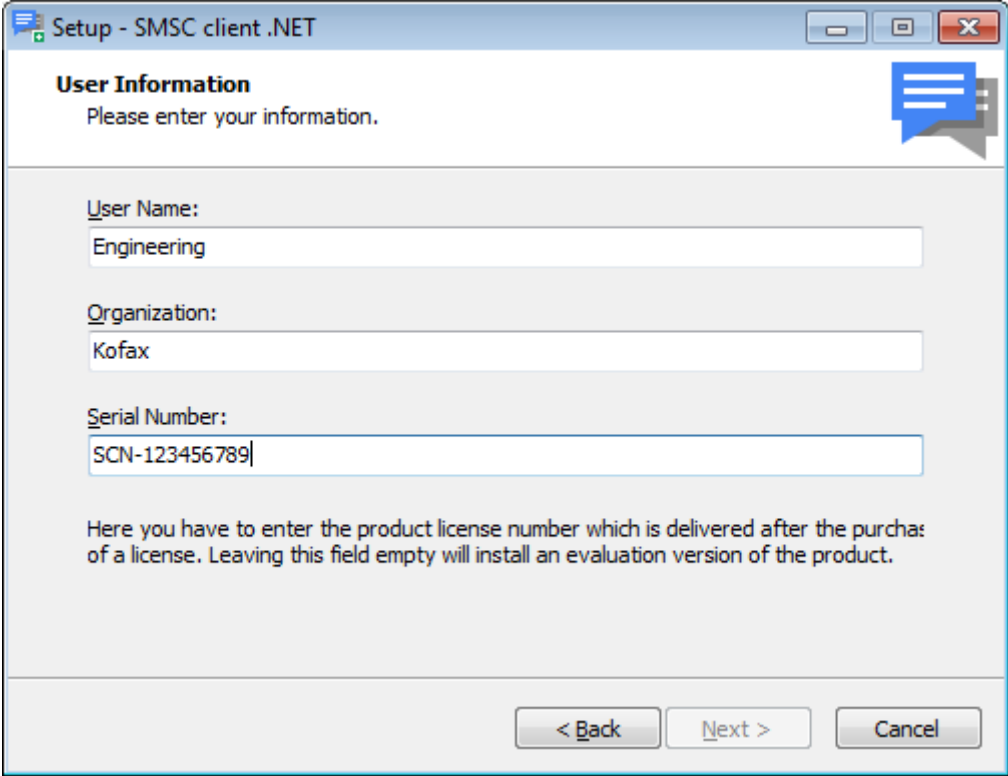
Registry Key	Description
OperatorX\TopsKeepAliveInterval	This setting changed from milliseconds to seconds and has to be changed manually!
OperatorX\TopsResponseTimeOut	This setting changed from milliseconds to seconds and has to be changed manually!
OperatorX\TopsEncoding OperatorX\TopsExtendedParameters	If TopsEncoding was previously set to 6 (TOPS SDK setting "etASCIIText"), the following configuration might be necessary: TopsEncoding = 0
OperatorX\TopsKeepAlive	Obsolete. Disabling protocol Keep-Alive packages can be done by setting TopsKeepAliveInterval to 0.

Installation

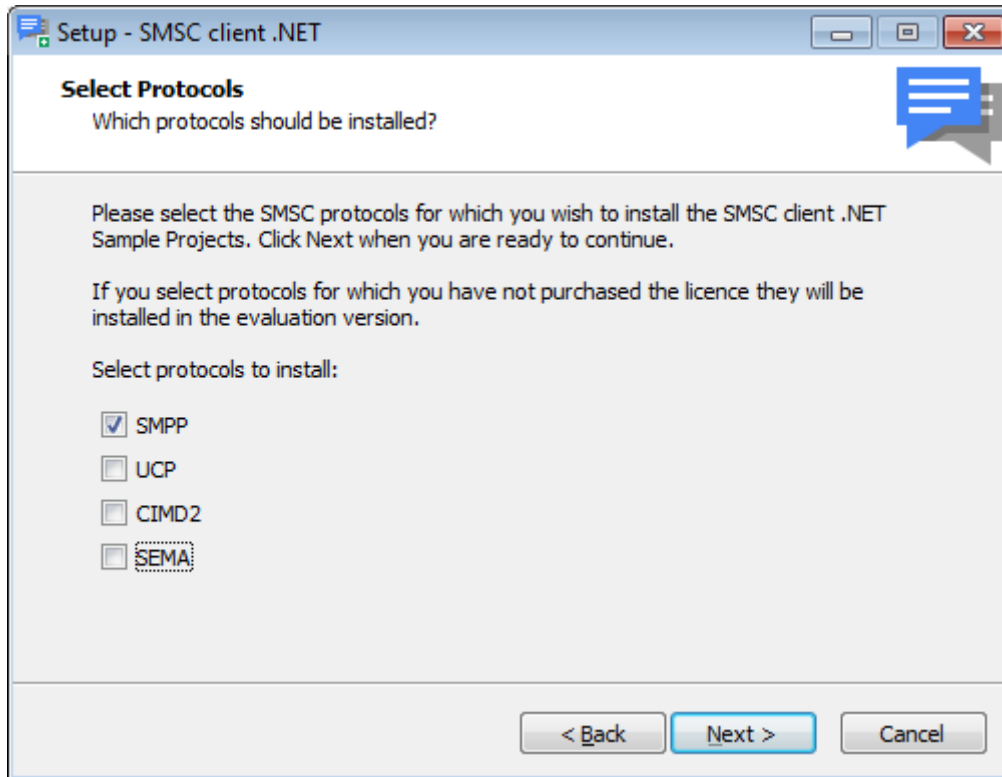
Note You can use the same license key for TOPS SDK version 7.x which you have used for TOPS SDK version 6.x.

1. Enter a valid license.

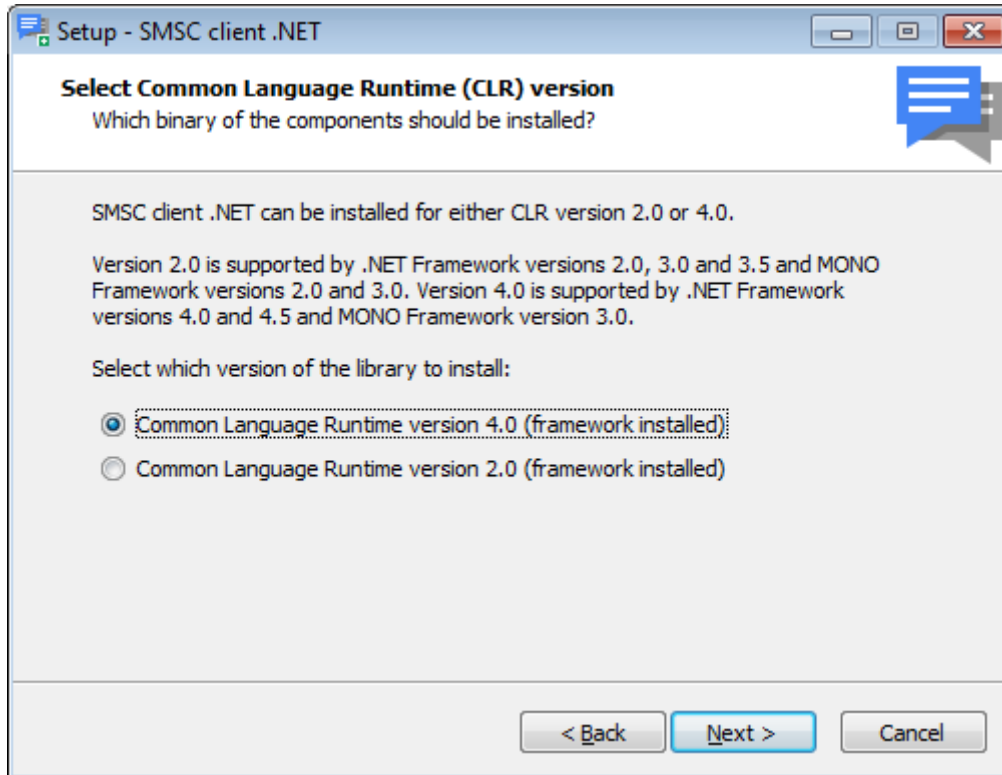
If your license number is not valid, the installed version is restricted and the content of the messages may be changed.

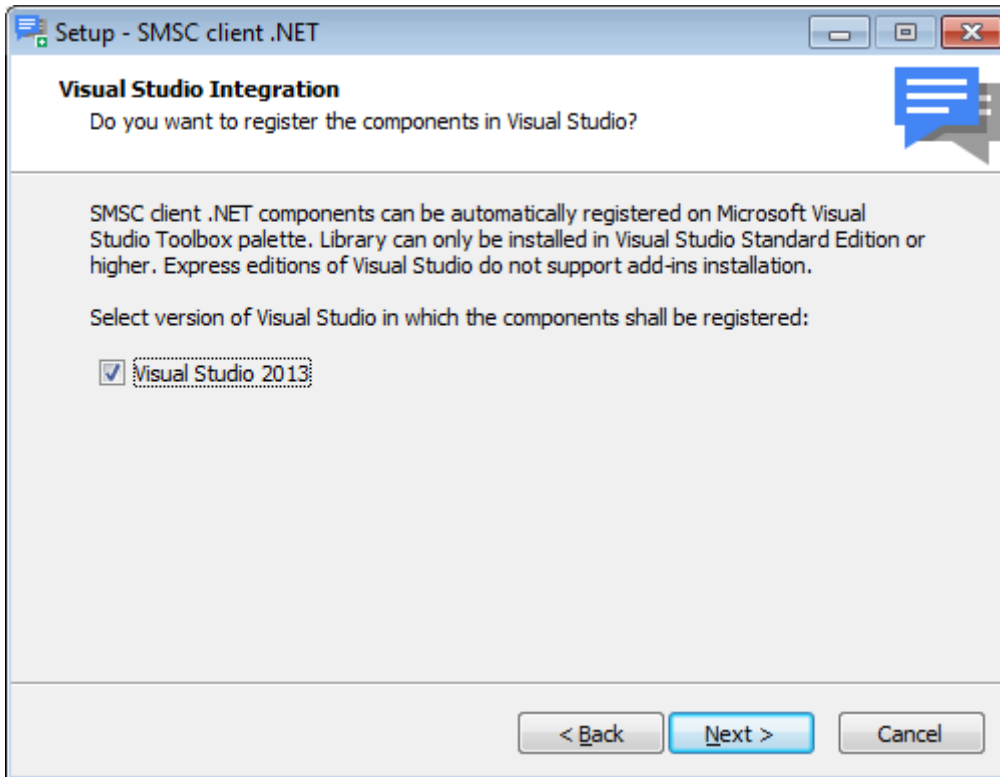


2. Choose the required protocol(s):

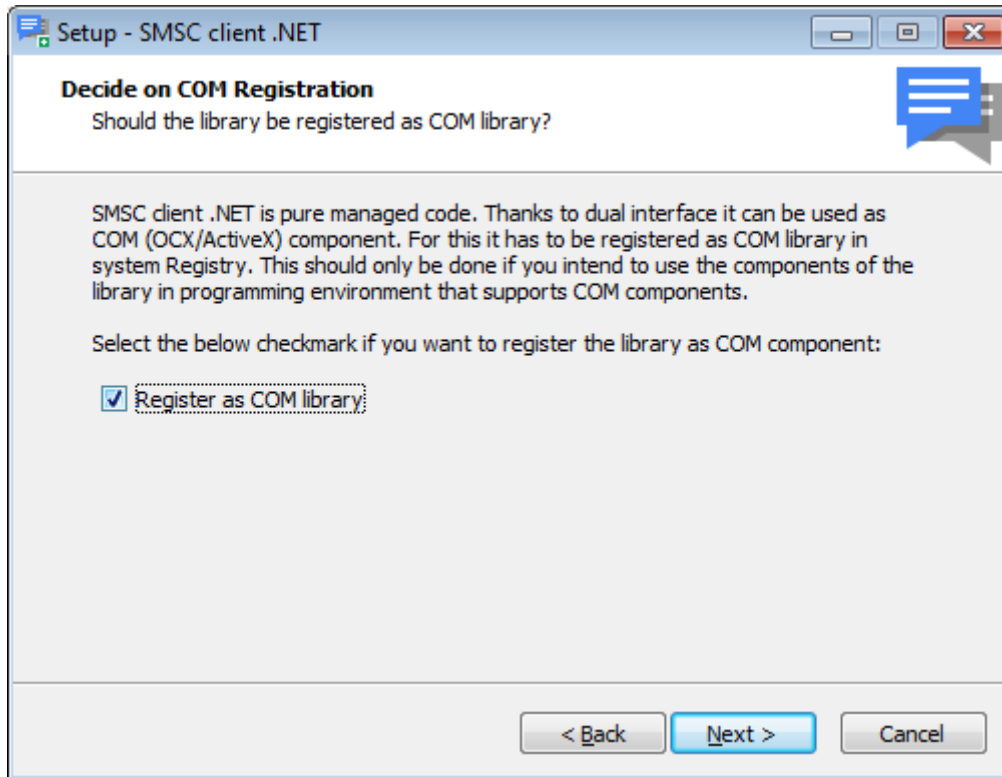


3. Select the appropriate Common Language Runtime (CLR) version based on your installed .NET Framework version.

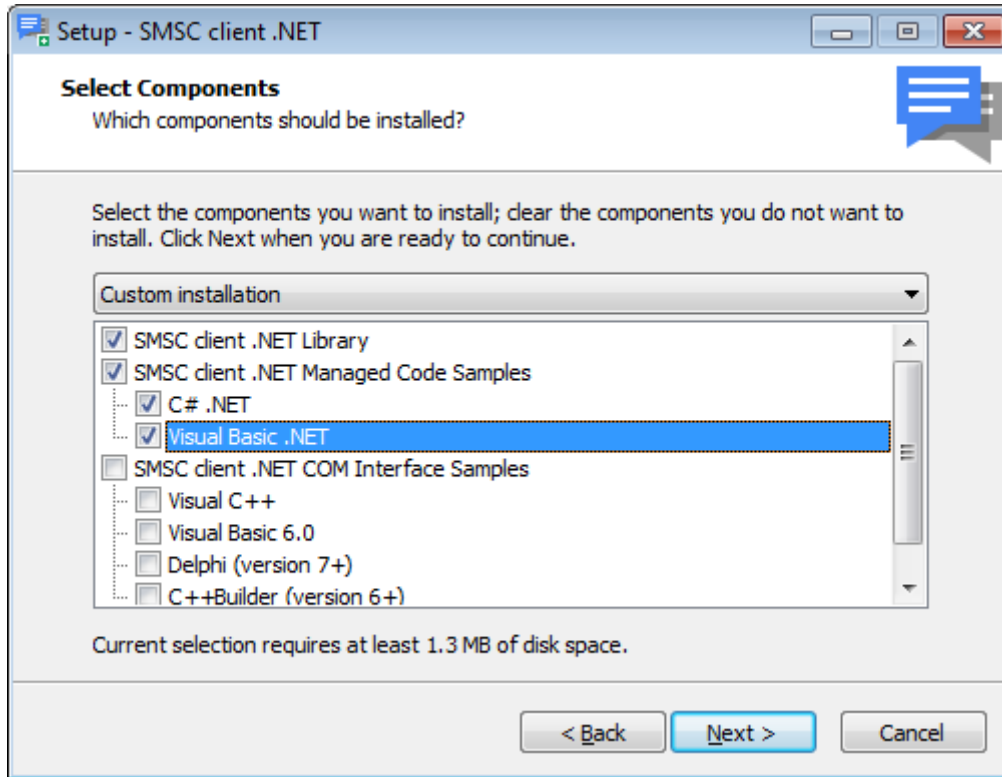




4. Check "Register as COM library (32 bit)":



5. Install the Library, the Documentation and the Examples. The Examples can be used for verifying the connection to the Operator (without any KCS software).



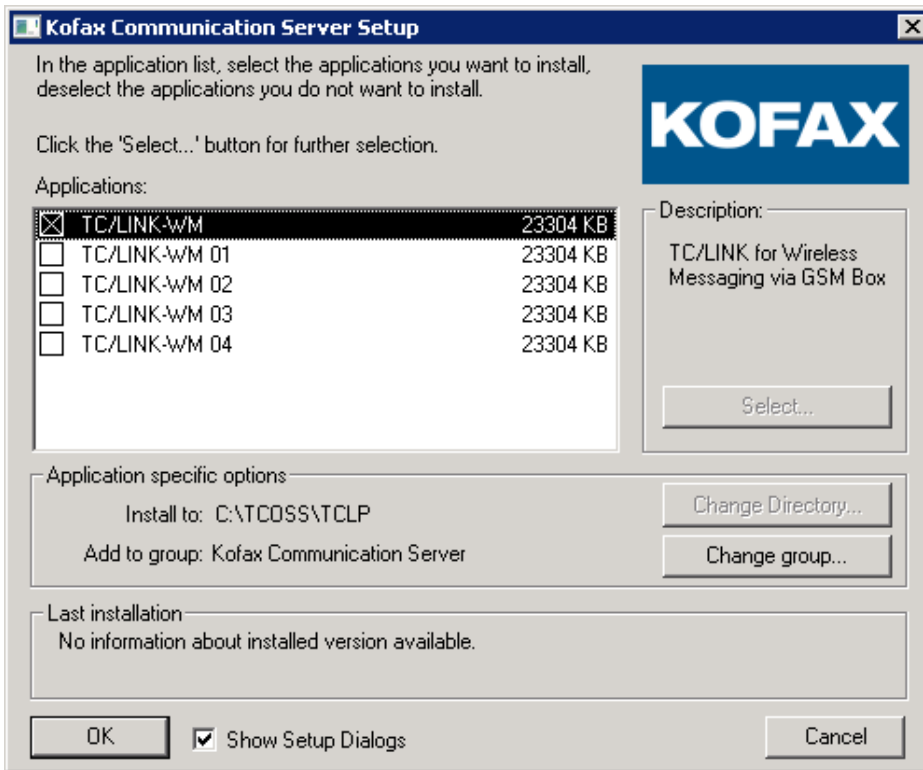
TC/LINK-WM Specific Setup Dialogs

This section provides information about TC/LINK-WM specific setup dialog boxes.

Multi Instance Setup

Kofax Communication Server setup shows TC/LINK-WM as an application group (in the Links group).

This group contains the standard TC/LINK-WM (registry key TCLINKWM) and four numbered instances (registry keys TCLINKWM01 to TCLINKWM04).



This makes it easier to maintain multiple instances on a single workstation, especially for Model305 GSM support.

For multiple instances (01 to 04) of TC/LINK-WM, setup uses the following default values:

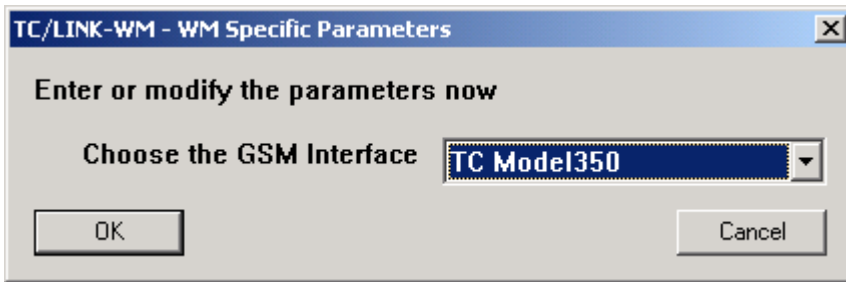
- Advanced Installation = enabled
- GSM box = TC Model305 GSM

	TC/LINK-WM 01	TC/LINK-WM 02	TC/LINK-WM 03	TC/LINK-WM 04
Port of GSM Interface	5004	5005	5006	5007
SMS Directory	C:\TCOSS\ SMSDir1	C:\TCOSS\ SMSDir2	C:\TCOSS\ SMSDir3	C:\TCOSS\ SMSDir4
Service	SMS1	SMS2	SMS3	SMS4
Queue	TCLWM1Q	TCLWM2Q	TCLWM3Q	TCLWM4Q

Note If several links are (by mistake) configured to use the same port and IP-address, only one of them can start successfully.

Choosing the GSM Box Type

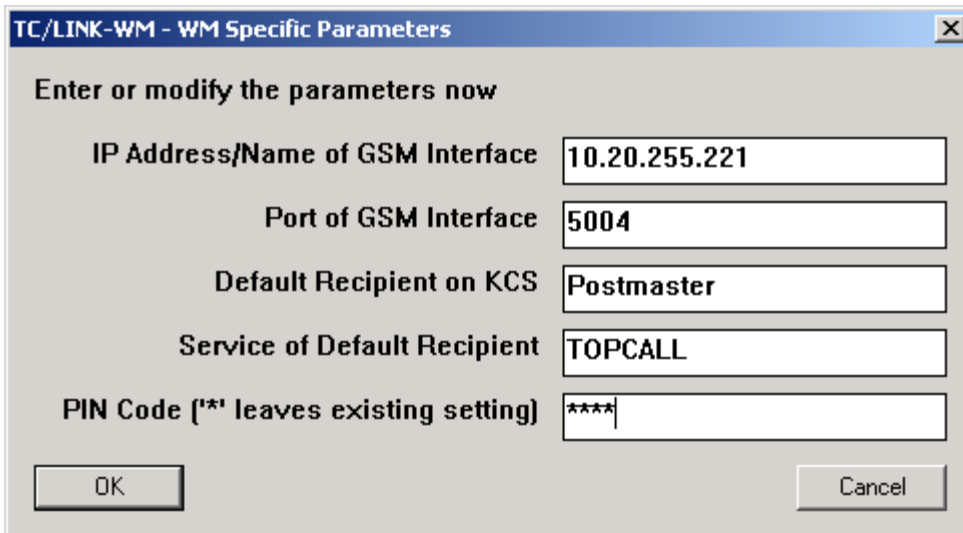
The first TC/LINK-WM specific setup screen lets you choose the GSM box (GSM Interface):



Choose which type of GSM box you want to use with TC/LINK-WM.

TC GSM Box Parameters

The following parameters have to be configured:



IP-Address/Name of GSM Interface (Registry: Protocol\GsmBoxAddress).

This is the network name of the GSM Interface.

Port of the GSM Interface (Registry: Protocol\GsmBoxPort). Depending on the GSM Interface this will be one of the following values:

TC Model360	5004
TC Model350	5004
TC Model305 GSM	5004 (first GSM channel), or 5005, 5006, 5007
TC GSM Box V1	23 (Telnet port)

If the registry key "GsmBoxPort" has not existed previously, above default values are proposed by setup. If this instance of TC/LINK-WM shall not use the first GSM channel of a Model 305, you have to choose the correct port manually.

TC Model 360 uses additionally port 30704 for an optional hardware reset during initialization. Operation is also possible if this port is not reachable (e.g. if it is blocked by firewall) but it recommended to allow TCP/IP connections from TC/LINK-WM to this port.

Default Recipient on KCS (Registry: Protocol\In\DefRecipient).

If a user sends via his mobile phone a message without specifying a recipient this number (using the default recipient service) gets the message.

Service of Default Recipient (Registry: Protocol\In\DefRecipientService).

The service of the default recipient.

PIN Code (Registry: Protocol\GsmBoxPinCode).

Every mobile phone's SIM Card has a PIN-code, a kind of numerical password. To access the SIM Card, TC/LINK-WM needs that code.

Additional Parameters

The following parameters have to be configured (Advanced Setup only):

Service to send via this link	SMS
SMS Directory (for temporary storing incoming SMS)	C:\TCOSS\SMSDir
Characters per SMS (Pager Support)	160
Prefix of inserted originator address	#
Maximum length of inserted originator address	10
Service for Inbound Routing (disabled if empty)	

Service to send via this link (Registry: Protocol\OwnService).

This parameter is used for automatic creation of dependencies and for internal use. If automatic creation of dependencies is activated, the specified service is created during link startup. Please note that the service name is restricted to a length of eight characters!

This service name is unique for this instance of TC/LINK-WM!

SMS Directory (Registry: Protocol\In\SMSDir).

Incoming messages from mobile to KCS are stored in files waiting to be handled by the link. These files are stored in this directory. Note that each instance of the TC-LINK/WM installed on the same PC needs a different directory.

Characters per SMS (Registry: Protocol\Out\MaxLengthSMS).

Since TC/LINK-WM is not only used for SMS but also for pager systems the length of one single message is configurable. If this key is missing, the value 160 is taken as default.

Prefix of inserted originator address (Registry: Protocol\Out\From).

These are the characters that are put before the originator in the short message.

Maximum length of inserted originator address (Registry: Protocol\Out\OriginatorLength).

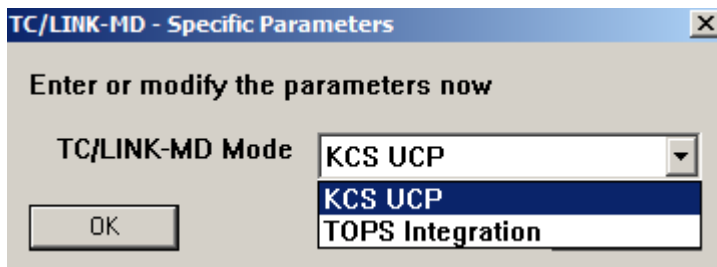
The maximum length of the originator in characters in an outgoing short message. Please do not forget the maximum length of an SMS itself: 160 characters. If the originator information becomes too long the text message may be truncated too early.

Service for Inbound Routing (Registry: Topcall\RoutingService).

This defines a service for inactive recipient-addresses for inbound routing. If an incoming SMS specifies a recipient, the recipient store is not only searched for a matching KCS user-id, but also for an address of the configured service.

TC/LINK-MD Specific Setup Dialogs

The first TC/LINK-MD specific setup screen lets you choose between the native KCS implementation of the UCP protocol and the TOPS Integration for the protocols UCP, SMPP, SEMA, CIMD2.



Depending on what you choose the next setup screen is that for KCS UCP or that for the TOPS Integration.

KCS UCP

The following parameters have to be provided by the GSM operator of the used SMS-Center for the UCP protocol (registry sub-tree HKLM\Software\TOPCALL\TCLINKMD\Protocol):

TC/LINK-MD - TC/LINK-MD Parameters

Enter or modify the parameters now

Short ID for SMS-Center 4711

Password for SMS-Center [*] leaves existing setting) *****

1st SMSC Address for Incoming SMS (IP:Port) 123.45.67.89:1234

2nd SMSC Address for Incoming SMS (IP:Port) 123.45.67.90:1234

1st SMSC Address for Outgoing SMS (IP:Port) 123.45.67.91:1234

2nd SMSC Address for Outgoing SMS (IP:Port) 123.45.67.92:1234

OK Cancel

- The Short-ID identifies your SMS-Center Large Account at the SMSC of the GSM operator. The Short-ID is also used to send messages from mobile phones to KCS.
- With the Short-ID a password has to be provided to authenticate to the SMS-Center.
- Four IP addresses and port numbers can be configured. The addresses for Outgoing SMS will be used by TC/LINK-MD to send messages to the SMSC. The addresses for Incoming SMS will be only used to accept messages and notifications from the SMSC, however all connections are able to receive messages. The 2nd addresses are only used if a connection to the 1st address is not possible.

Hints:

- Only configure an address for incoming SMS if this is required (and provided) by your operator. Incoming SMS are also possible via the connection for outgoing SMS.
- The secondary addresses can be used if your operator provides addresses for redundancy.
- The addresses are specified by the IP address, a colon and the port number.

TOPS Integration

The following parameters have to be provided by the GSM operator of the used SMS-Center. The settings are written to the registry sub-tree HKLM\Software\TOPCALL\TCLINKMD\Protocol\Operator0

TC/LINK-MD - Specific Parameters

Enter or modify the parameters now

Name of Operator (only for displaying)

SMS-Center Protocol

Short ID for SMS-Center Account

Password for SMS-Center (** leaves existing setting)

1st SMSC Address for Incoming SMS (IP:Port)

2nd SMSC Address for Incoming SMS (IP:Port)

1st SMSC Address for Outgoing SMS (IP:Port)

2nd SMSC Address for Outgoing SMS (IP:Port)

System Type (SMPP Protocol only)

Bind Mode (SMPP Protocol only)

- The Name of the Operator is only used for convenience in the trace file.
- One of the SMS-Center Protocols UCP, SMPP, SEMA, CIMD2 has to be chosen. For this protocol you also need the TOPS license.
- The Short-ID identifies your SMS-Center Large Account at the SMS-Center of the GSM operator.
- With the Short-ID a password has to be provided to authenticate to the SMS-Center (Exception: This is not necessary for the SEMA protocol).
- Four IP addresses and port numbers can be configured. The addresses for Outgoing SMS will be used by TC/LINK-MD to send messages to the SMSC. The addresses for Incoming SMS will be only used to accept messages and notifications from the SMSC, however all connections are able to receive messages. The 2nd addresses are only used if a connection to the 1st address is not possible.

Hints:

Only configure an address for incoming SMS if this is required (and provided) by your operator. Incoming SMS are also possible via the connection for outgoing SMS.

The secondary addresses can be used if your operator provides a 2nd address for redundancy. It does not make sense to specify the same for the 1st and the 2nd address.

The addresses are specified by the IP-address or name, a colon and the port number.

- The following additional parameters are provided by your operator for the SMPP protocol:

System Type

Possible Bind Modes are Transceiver, Transmitter and Receiver. If you do not configure "Transceiver", the outgoing connections will bind as "Transmitter" and the incoming as "Receiver".

There are several more configuration possibilities that are not supported by setup. See the section on the registry settings. All additional registry keys are written by TC/LINK-MD at start-up.

Additional connections (registry sub-trees Operator1 – Operator9) also have to be configured in the registry manually. See the section on the registry settings.

Additional Parameters

The following dialog lets you configure KCS specific parameters:

The screenshot shows a dialog box titled "TC/LINK-MD - TC/LINK-MD Parameters". The dialog contains the following fields and values:

Parameter Label	Value
Service for SMSC Messages	SMSC
Default Recipient for Incoming SMS	postmaster
Default Recipient Service for Incoming SMS	TOPCALL
Default Reply Address for Outgoing SMS	8050001
Service Providing Reply Address for Outgoing SMS	SMSCOUT

Buttons: OK, Cancel

Service for SMSC Messages (Registry: Protocol\OwnService).

This parameter is used for automatic creation of dependencies and for internal use. If automatic creation of dependencies is activated, the specified service is created during link startup. Please note that the service name is restricted to a length of 8 characters!

This service name is unique for this instance of TC/LINK-MD.

Default Recipient on KCS (Registry: Protocol\In\DefRecipient).

If a user sends via his mobile phone a message without specifying a recipient this number (using Default Recipient Service) gets the message.

Default Recipient Service (Registry: Protocol\In\DefRecipientService).

The service of the default recipient.

Default Reply Address (Registry: Protocol\Out\ReplyAddressDefault).

The number that is set as originating address for the SMS. The recipient will be able to send replies to this number.

Service Providing Reply Address (Registry: Protocol\Out\ReplyAddressService).

If the originator has an address defined for this service, this number will be taken as originating address.

Multiple Instances

If you are installing multiple instances of TC/LINK-MD on one computer as described in general TC/LINK Manual, chapter "Installing Multiple Instances of the Same Link Type", you need to perform an additional configuration step after the installation:

Each link instance needs a separate dedicated directory for storing inbound SMS messages. This is configurable in the registry value <link name>\Protocol\In\MDDir; it must be different for each link instance.

TC/LINK-MD and Sonera Content Gateway

The Finnish GSM operator Sonera allows connecting to its SMS-Center via the “Content Gateway”. The Content Gateway is installed locally (on the TC/LINK-MD computer, or at least inside the network of the customer using the TC/LINK-MD). It routes the messages between TC/LINK-MD and the Sonera SMS-Center.

The following steps are necessary to use the Content Gateway.

Sonera Content Gateway

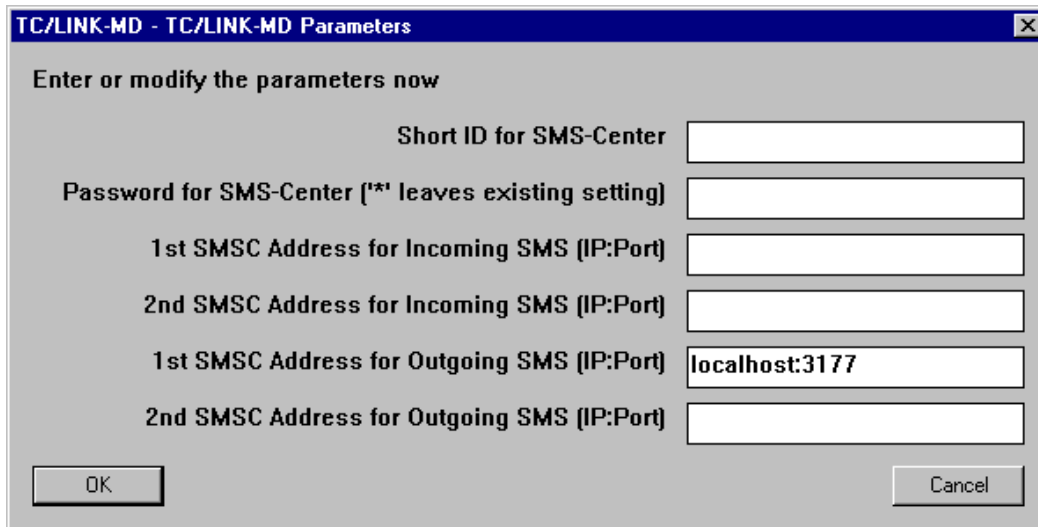
- Install Sonera’s Content Gateway 4.0.
- Obtain a license for UCP-tunneling (including a Short-ID “allow-msid”)
- Copy the license and configuration files to the Content Gateway directory
- Use the Web Admin Tool to configure the license file (and UCP-tunneling, if not already done by the files you got from Sonera)

TC/LINK-MD with KCS UCP

This section describes the TC/LINK-MD installation with KCS UCP.

TC/LINK-MD Setup

Install TC/LINK-MD according to TC/LINK and TC/LINK-MD manual. Choose “KCS UCP” during setup. Then the following setup screen appears.



- The Short-ID has to be left empty. The Content Gateway uses its own identification and authentication. TC/LINK-MD skips the UCP authentication when there is no Short-ID configured.
- 1st SMSC Address for Outgoing SMS: IP and Port have to be configured. If the Content Gateway is installed locally on the Link-Computer using the default port, this is "localhost:3177".
- All other values have to be left empty.

Notification Address and Listener

To receive SMS via the Content Gateway you also have to configure a Listener for TC/LINK-MD. This address also has to be configured in the Web Admin Tool of the Content Gateway.

For receiving GSM Status Reports (Notifications) you also have to specify an Address where the notifications have to be put to. This has to be the address of the Listener.

If the Content Gateway is installed locally, you can set the Notification Address and a Listener both to the localhost IP address. The port address can be chosen randomly, but it must not be used by any other application and must not have more than four decimal digits.

Example:

...TCLINKMD\Protocol\AddressNAdC	=	"127.0.0.1:4711"
...TCLINKMD\Protocol\Listener1	=	"127.0.0.1:4711"

TC/LINK-MD with TOPS Integration

During Setup, choose TOPS Integration. In the following dialog choose "UCP", set the ShortId and "1st SMSC Address for Outgoing" to the address of the Content Gateway.

After Setup and the first start-up, you also have to set the local listener address for incoming SMS and notifications. If the Content Gateway is installed locally, you can set it to the localhost IP address. The port address can be chosen randomly, but it must not be used by any other application and must not have more than four decimal digits.

Example:

...TCLINKMD\Protocol\Operator0\UcpListener	=	"127.0.0.1:4711"
--	---	------------------

Dynamic Unicode Character Support

For countries where non-GSM 7-bit characters and characters of the GSM 7-bit default alphabet are used, dynamic character encoding is supported. In this case TC/LINK-WM (MD) checks if the SMS to send contains only GSM 7-bit supported characters. If an unsupported character is found, the SMS is sent as a Unicode message; if only GSM 7-bit characters are found, the SMS is sent as GSM 7-bit message.

A GSM 7-bit coded SMS may contain a maximum of 160 characters. A Unicode coded SMS may only contain 70 characters. If concatenation is used, some characters of a single SMS are used as additional header, in this case the length of a single SMS is 153 (GSM 7-bit) or 67 (Unicode). So dynamic Unicode character support helps saving costs – on the other hand, it becomes more transparent for the user how many SMS are needed to send a message.

See *Unicode Installation Guide* for general information about Unicode.

Configuration

For dynamic Unicode character support you need a conversion table that defines the conversion from your Windows code page to GSM 7-bit. Values that are not supported in GSM 7-bit and that should make TC/LINK-WM (MD) to send the message in Unicode have to be set to the value 0xff (as the GSM alphabet is only 7-bit, 0xff is an invalid value).

Additionally the following registry configuration has to be set to 1:

```
HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKxx\Protocol\Out
```

CodingUcs2IfNecessary	DWORD	0	Defines if UCS2 has to be used if necessary (Dynamic Unicode Character Support). 0 – Static setting of character coding 1 – Dynamic setting of character coding – Unicode is used if non GSM 7-bit characters are found in the message
-----------------------	-------	---	--

Example

Windows code page is 1256 (Arabic), the TC/LINK-WM (MD) configuration of the code pages have also to be set to 1256:

```
HKLM\Software\TOPCALL\TCLINKxx\General\PCCodePage = 1256
HKLM\Software\TOPCALL\TCLINKxx\Topcall\CodePageAutoDetect = 1
```

Note The TCOSS system is supposed to run either with Unicode or with Arabic – in this case CodePageAutoDetect will set TOPCALL\CodePage either to 65001 or to 1256.

The file "GsmConversionFile.txt" (for TC/LINK-WM and TC/LINK-MD TOPS) has to contain the four conversion tables for 1256:

```
[1256-GSM]
# MT message translation:
```



```
# ANSI character set to Mobile character set translation
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F #
0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0x20,0x0A,0xFF,0x1B,0x0D,0xFF,0xFF, # 0
0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0x1B,0xFF,0xFF,0xFF,0xFF, # 1
0x20, '!', 0x22,0x23,0x02, '%', '&', 0x27, '(', ')', '*', '+', ',', '-', '.', '/', # 2
'0', 0x31, '2', '3', '4', '5', '6', '7', '8', '9', ':', ';', '<', '=', '>', '?' , # 3
0x00, 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O' , # 4
...
0x1B,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF, # 8
0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF, # 9
0x20,0x40,0xFF,0x01,0x24,0x03,0xFF,0x5F,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF, # A
...
```

Note the characters that are set to 0xFF.

Dynamic Unicode character support has to be enabled:

```
HKLM\Software\TOPCALL\TCLINKxx\Protocol\Out\CodingUcs2IfNecessary = 1
```

GSM 7 Bit: Replacing Invalid Characters

If GSM 7-bit is used always, you can configure a special character that replaces the 0xFF of the coding table.

```
HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKxx\Protocol\Out
```

CodingReplaceNon7bit	DWORD	0x60	If GSM 7-bit is used always, the invalid characters (0xFF of the coding table) are set to this value.
----------------------	-------	------	---

Chapter 6

Hints and Troubleshooting

This section describes hints and troubleshooting.

Restrictions

This section describes restrictions.

General Restrictions

- Delivery type authorize is not supported.
- Attachments are just ignored – no non-delivery notification will be created, the message text part is sent as SMS.
- All in all just 160 characters (or less, configurable by registry key Protocol\Out\MaxLengthSMS) are sent restricted by SMS. In Unicode mode, only 70 characters are possible. TC/LINK-WM (MD) however can split one KCS message to up to 20 SMS (registry key Protocol\Out\MaxNumberSMS).
- For Character Conversion see section on Code Page Conversion.

Binary SMS Restrictions

- Incoming binary SMS are not supported.
- The receiving mobile phones have to support the binary message type you are sending. If they do not support it, they will either not be able to represent it correctly, or they will not receive it (despite the messages status changing to “Delivered”).
- Some mobile phones (e.g. the Nokia 7650) have problems displaying VCards and VCalenders without <CR><LF>. TC/LINK-WM/MD however replaces them by default with <LF> only. To change this, set HKLM\Software\TOPCALL\TCLINKMD\Protocol\Out\CRLFCharacter = 0. Keep in mind that makes the SMS longer (and you will have to modify the examples in this manual).
- The GSM operator has to support sending the binary message types you want to send.
- Only one SMS per KCS message is possible.
- Additional information (subject, more parameters in the message part, originator information) is not transmitted.
- Splitting (concatenation) of long binary messages is not supported by KCS. This has to be done by creating separate KCS messages with the appropriate User Data Header consisting of the concatenation information.
- The <CODING> type “HEX” can only be used with TC/LINK-WM. For TC/LINK-MD it is only possible to use “TEXT” for a GSM 7bit (Default Alphabet) or 16bit (UCS2) coded SMS or “BINARY” for a GSM 8bit (Binary) coded SMS.

- There are no syntax checks done regarding the validity of the SMS. Only if a <CODING> type “TEXT” message is too long, the message is rejected.
- If using <CODING> “TEXT”, white spaces have to be set according to the used message type specification in the <BODY> part. Additional blanks or line feeds will make them unreadable, also at the end of the message body! When using “HEX” or “BINARY”, white spaces are removed.
- The SMS-Center protocol UCP requires an additional type parameter for the User Data Header. This parameter is set by TC/LINK-MD to “01”, meaning “User Data Header information according to GSM 03.40”. Other – UCP specific – Binary SMS types are therefore not supported.

TC/LINK-WM Specific Restrictions

- Depending on location of the GSM interface, external GSM antenna may require mounting outside of building.
- Just one TC/LINK-WM connection to one TC GSM box is possible. The feature Multi-Inst-Support does not comply with End-to-End Notifications and is not supported any longer.
- No End-to-End Notifications are possible for the Falcom A1 modem (TC GSM Box V1, TC55 with Falcom A1 modem).
- The correlation between original message and notification can only be done by the destination number and the transaction reference number, which is returned by the SMS-Center and is only a number in the range between 0 and 255. This means that it is possible that status notifications can be correlated incorrectly and that KCS messages can remain open. This is a restriction of the GSM protocol.
- If the modem or TC/LINK-WM is switched off, incoming notifications are lost and messages remain unterminated, there are no additional send attempts of the SMS-Center for notifications.
- For Fault Tolerance of incoming SMS (direction to KCS) see the special section.

TC/LINK-MD Specific Restrictions

- An SMS-Center Large Account is not the same as a telephone SIM card identified by an international number. The SMS-Center Large Account is defined by a Short-ID that is only addressable inside the network of the GSM Operator. Therefore it is only possible to send SMS to TC/LINK-MD (and to KCS) from mobile phones of this GSM operator.
This is a restriction of the GSM operator, not of KCS. Some Operators (e.g., the Finnish operator Sonera) also provide an international number that is mapped to the SMS-Center Large Account Short-ID. Then SMS sending from outside the GSM network is also possible.

KCS UCP Restrictions

- Connections to multiple operators are not possible. One TC/LINK-MD instance can only handle one set of connections to one GSM Operator
- When using the Sonera Content Gateway, notifications do not seem to be buffered and resent correctly by the SMSC when TC/LINK-MD is down. As long as all is running it works fine however. How this works with a direct SMSC connection remains to be validated.
- AddressNAc and AddressLRAd: Port numbers are only allowed to have 4 digits. This is a restriction of the UCP protocol.

TOPS Integration Restrictions

- Latest Delivery/GSM Validity Period is only supported for SMPP, not for the other protocols.

- Only outbound UCP connections are supported. This means that when using it with the GSM Operator Sonera, no inbound SMS and no status reports (notifications) are possible.
- It is possible to use one TC/LINK-MD instance to connect to multiple GSM Operators. This connections are defined within the registry sub-tree "...Protocol\OperatorX". All other configuration has to be the same for this TC/LINK-MD instance.

Known Restrictions Regarding Operators/Protocols

Tests have been made with the following operators - protocols:

- Sonera – UCP
- Swisscom - UCP
- Vodacom – SMPP
- Era – SEMA
- Plus – CIMD2
- World-Text – SMPP

Most of the restrictions are due to settings and restrictions of the GSM-operator and not of the protocol that is used.

Feature\Operator (Protocol)	Sonera (UCP)	Swisscom (UCP)	Vodacom (SMPP)	Era (SEMA)	Plus (CIMD2)	World-Text (SMPP)
Concatenated Messages using the User Data Header (1)	OK (6)	OK	No	OK	OK	OK
International Prefix (How does international addressing work?)	"+" OK, "00" OK	"+" Error 6, "00" OK, "" NonDel	"+", OK "", OK	"" OK	"+" OK, "00" OK	"" OK (7)
Defining the Originator (2)	OK	OK	OK (depending on receiving network)	No	Number added to ShortID	No, MD setting ignored
Defining an Alpha-numeric Originator (2)	OK (6) – but then no Notif is received	OK	OK (depending on receiving network)	No	No (Error 321)	No, MD setting ignored
Characters (7-bit coding):						
At: @	OK	OK	OK	OK	OK	OK
Extended GSM code page: Euro "€", Special Brackets "[]", "{ }"	OK	OK	No (except on receiving Polish operators)	OK	OK	OK
German special characters: Ä Ö Ü, ä ö ü, ß	OK	OK	Yes (except receiving on operator A1)	OK	OK	OK
Unicode (3)	OK	OK	OK	OK	OK	OK
Unicode & Concatenation (4)	No (Error 2)	OK	No	OK	OK	OK
Flash Messages (<C0>) (5)	OK	OK	OK	OK	OK	OK

1. Configuration: ...Protocol\Out\GsmConcatenate =1; Message > 160 Characters

2. Configuration: ...Protocol\Out\ReplyAddressDefault or ReplyAddressService and defining an address for the originator of this service
3. By default the file "c:\tcoss\tclp\GsmConversionFile.txt" is used to translate to the GSM code page (only for checking the length in fact). If this file is not found, Unicode (UCS2) is used
4. See (1) and (3); Message > 70 Characters
5. Using the send option <C0>, e.g. sending: "SMSC,<C0>06641234567"
6. In order to make concatenation work with the UCP protocol, the originator address (registry "ReplyAddressDefault") has to be purely numeric (no +, no characters).
7. For the international "+" to work as well, you might add it to the Protocol\Out\NumberCharRemove key and remove it from Protocol\Out\NumberCharSet

Hints

This section describes hints.

General Hints

This section describes general hints.

Euro-Character on Older Mobile Devices

If the mobile device does not support the Euro-Character or the GSM extension code page, it will typically map the unknown characters to blanks. So either you will just get a blank or a blank and the character 'e'.

How to Use All 160 Characters for an SMS

The following registry keys have to be set to use all 160 characters for the message text.

- HKLM\Software\Topcall\TCLINKMD\Protocol\Out\MaxNumberSMS = 1
- HKLM\Software\Topcall\TCLINKMD\Protocol\Out\From = ""
- HKLM\Software\Topcall\TCLINKMD\Protocol\Out\OriginatorLength = 0
- HKLM\Software\Topcall\TCLINKMD\Protocol\Out\SepOriginatorSubject = 0
- HKLM\Software\Topcall\TCLINKMD\Protocol\Out\SepSubjectText = 0
- HKLM\Software\Topcall\TCLINKMD\Topcall\AllowLongLinesToMail = 1

MaxNumberSMS does not necessarily have to be set to 1, but if the message is longer, it will be split. The characters defined on the extended GSM code page (like "€", "[", "]", "{", "}") need the space of two characters. Unicode SMS have a maximum length of 70 characters.

Failsafe Termination of Messages

Configure a maximum delivery timeout in the default message template of the link that forwards the SMS from the mail system where the messages are generated (typically Notes, Exchange,...). If no delivery timeout is configured the send orders remain open for ever, regardless if delivery is possible or not.

TC/LINK-WM Specific Hints

This section provides TC/LINK-WM specific hints.

Reception Text for GSM-Number

An incoming call is detected and ignored. After some rings the mailbox of the GSM-Provider will answer the incoming call, so it would be advisable to have a reception-text for this GSM-Number hinting that this number will not accept any incoming calls.

Security

The GSM modem of the TC/LINK-WM sends and accepts only SMS-messages. The software of the TC/Link-WM will always ignore an incoming call. Incoming SMS are handled as messages and put to the KCS-Server.

The LAN-Interface of the TC GSM box has an IP-address and is accessible for instance by telnet. If there is no open connection to the TC/LINK-WM Server it is possible to connect to the modem via LAN and to establish a connection to any telephone-number outside. So there has to be restricted access to the LAN interface from inside the LAN.

With the TC Model305 GSM Interface it is possible to configure encryption. In this case only the TC/LINK-WM software is able to communicate with the modem via LAN.

TC/LINK-MD Specific Hints

This section provides TC/LINK-MD specific hints.

Multiple Instances – Test Systems

Take care when using one SMS-Center Large Account with multiple instances of TC/LINK-MD. Multiple instances must connect to the same KCS system. Especially when switching from the test to the productive environment do not forget to switch off the test instances, or else messages and notifications go to any of the KCS systems and messages seem lost or send orders remain open.

Multiple Instances – GSM Concatenated Messages

When using one SMS-Center Large Account with multiple instances of TC/LINK-MD, it is not guaranteed that all parts of an incoming GSM concatenated message are received by the same link instance. By default, TC/LINK-MD temporarily stores the sub-messages in a local folder and then reassembles them. Thus, one concatenated message can result in several KCS send orders, each holding a fragment of the original message text.

To guarantee correct concatenation of the received message parts, TC/LINK-MD must be configured to store them temporarily in a KCS folder which is shared by all instances. For this purpose, you need a dedicated KCS user account whose message folder is not used for other purposes. Currently, the user must be created via TCFW. The user need not have any rights or events.

On all parallel TC/LINK-MD instances, write the name of this user into the following registry value:

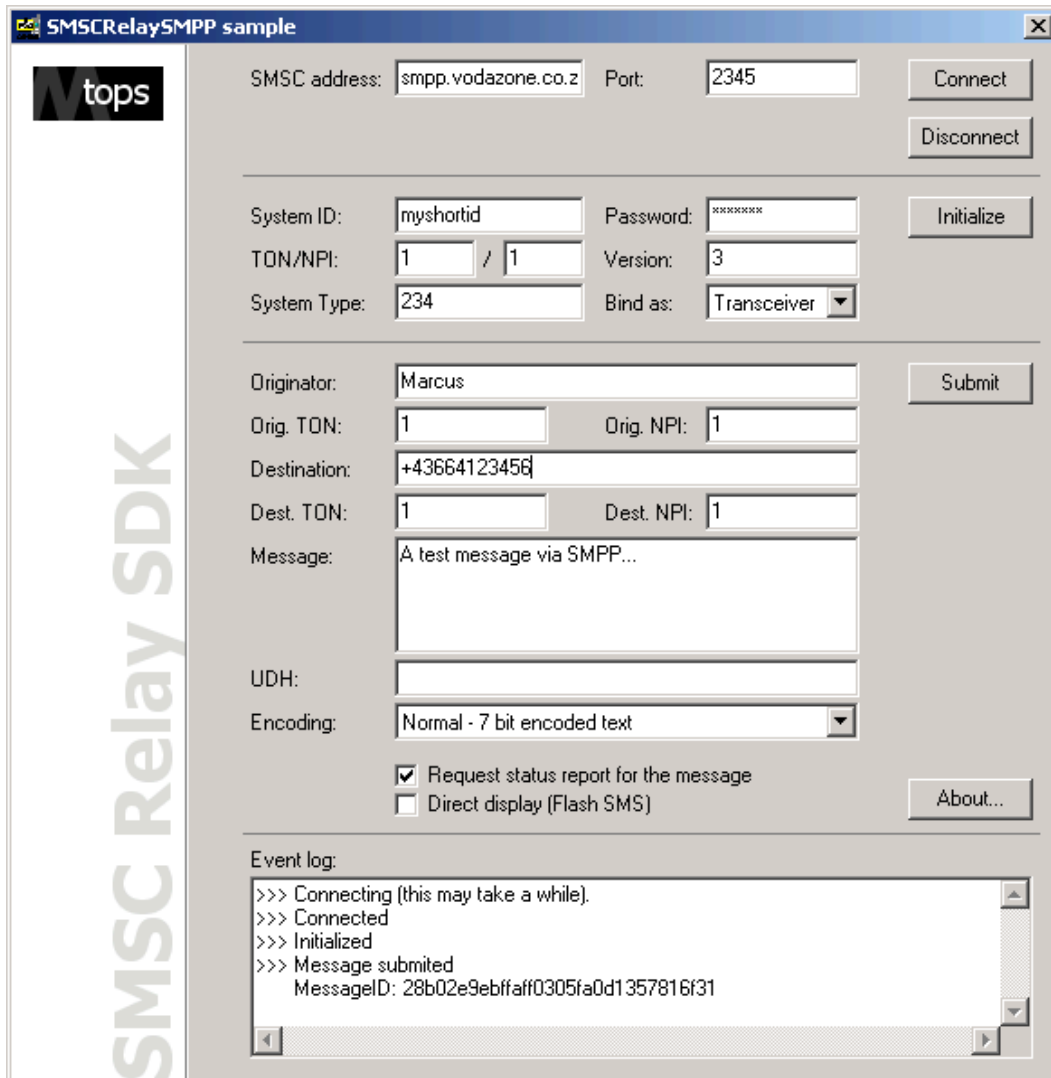
HKLM\Software\Topcall\TCLINKMD\Protocol\In\MDDirTcossFolder

Testing Connections

For testing a connection to an operator you can use the example applications of the TOPS library (also if using the KCS UCP Implementation – but you have to install the TOPS library, you can use the evaluation mode without having a license).

You find them (default installation) in the following directory: “C:\Program Files\SMSC client .NET\demo”.

The application for SMPP looks as follows:



You can connect to your operator, initialize and send an SMS. In the status box at the bottom you see if the operations are successful, and you can also receive status reports (notifications) and incoming SMS.

The example applications for the other protocols are similar – only the configuration possibilities are a little different.

Error Codes

Error Codes for all SMS-Center protocols are available at the following link: <http://www.tops.com.pl/en/smscc/manual/index.html>.

Mapping of UCP error codes to KCS error codes.

UCP Error Codes	Mapped KCS Error Codes	Description
107	AS	Absent subscriber
108	DF	Delivery fail
All (except error codes 107 and 108)	SO	latest delivery timeout expired

Errors & Solutions

TC/LINK-MD (using TOPS Integration) does not start up. The Windows Event-log shows the following entry:

“wLNK_Enable: Internal error 5031 (**Initialize Error - Create TopsDialogSmpp failed (0)**) The parameters of this log entry and previous event log entries may give more information. Check the trace file (trace level 100, maildebug, tcsidebug).”

Possible reason and solution:

The TOPS SMSC client .NET (or one of the required SMS-Center protocols) is not installed correctly. Install the TOPS SMSC client .NET, choose the necessary protocol(s). This would be SMPP in this example.

TC/LINK-MD (using TOPS Integration) does not start up. The Windows Event-log shows the following entry:

wLNK_Enable: Internal error 5031 (**SMSC Initialize Error (Plus: 102)**) The parameters of this log entry and previous event log entries may give more information. Check the trace file (trace level 100, maildebug, tcsidebug).

Possible reason and solution:

You specified an “AddressIn” address, however your account does only accept one connection, so the second connection fails. Set the registry value “...TCLINKMD\Protocol\OperatorX\AddressIn1” to empty string. The Out-connection is capable of receiving as well. The In-connections will not be used for sending and are only necessary if an own connection is requested by the operator for incoming SMS.

Fault Tolerance

Fault tolerance is achieved by the installation of multiple TC/LINK-WM (MD) instances on multiple computers polling the same KCS queue using the same service-name.

TC/LINK-WM Fault Tolerance

Each TC/LINK-WM has to be connected to its own TC GSM box channel.

Note A mail system, as mentioned in TC/LINK Manual section on Fault Tolerance, equals a TC GSM box channel.

Nevertheless, there are some restrictions to mention for sending from SMS to KCS:

- When sending from SMS to KCS, fault tolerance is not guaranteed. You have to send to a specific link (equals GSM box, equals phone number). This link could be temporarily out of order. In that case the SMS is stored on the chip in the SMS box. No automatic rerouting to the other numbers is possible.
- When sending from SMS to KCS and receiving notifications back on the mobile, it can happen that the notification is received via a different link, because they are sharing the same queue on KCS. This means that a different number will be displayed in the notification on the mobile. That can be confusing for the user.
- Because it cannot be guaranteed which link sends the notification to SMS, all GSM boxes connected to the links who share a KCS queue should connect to the same GSM operator. Otherwise restrictions in SMS delivery between the GSM providers could apply.

TC/LINK-MD Fault Tolerance

To be failsafe against the SMS-Center you can configure secondary SMS-Center addresses for each connection.

The following parts are necessary for a fully fault tolerance system:

KCS:	Tandem System
TC/LINK:	Multiple TC/LINK instances on different computers
SMS-Center:	Specify the secondary addresses

If one IP-address defining one SMS-Center is unavailable, TC/LINK-MD will use the secondary IP-address of the same SMS-Center. TC/LINK-MD will not use another connection via another GSM-operator. Instead alternative routes should be tried by KCS. This is because another GSM-operator will mean other (higher) costs, and this must not be transparent for KCS -> KCS has to know about the route and the costs. You can configure alternative routes in the RR99 file on KCS.

Chapter 7

Registry Keys Used by TC/LINK-WM (MD)

See the TC/LINK Manual for all general registry keys. Here are the keys described that are used by the special Link-DLL. TCLINKxx stands either for TCLINKWM or TCLINKMD.

The following general TC/LINK parameters are also used by the special TC/LINK-DLL (tclmd.dll)
HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKxx

Registry Key	Type	Default	Description
General\LnkChars	STRING	WM: "WM" MD: "MD"	Identifying the Link-Type, TC/LINK-WM or TC/LINK-MD
General\TraceLevel	DWORD	10	The used trace level
General\PCCodePage	DWORD		Number of the used PC code page
Topcall\CodePage	DWORD		Number of the used KCS code page
Topcall\NotifMail	DWORD	WM: "0" MD: "1"	If 0, a message is terminated after accepted by the SMSC, else the message is only terminated after the SMSC returned a delivery or non-delivery notification

General Settings

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKxx\Protocol

Registry Key	Type	Default	Description
CostsPerSMS	DWORD	0	Accounts the configured costs for each sent short message, this can be multiple for a single KCS message due to split SMS.
GsmConversionFile	STRING	c:\tcoss\tclp \GsmConversionFile.txt	Path to the alphabet conversion file defining the conversion between the GSM default alphabet and PC code pages. This file is used by TC/LINK-WM. TC/LINK-MD uses it only for the TOPS Integration and only for calculating the length of an SMS.
InternationalPrefix	STRING	"+"	This key is used by the MAP-file (See General TC/LINK Manual)
OwnService	STRING	WM: "SMS" MD: "SMSC"	KCS service used by this TC/LINK instance.

Settings for Incoming SMS

The following parameters are only for incoming messages: HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKxx\Protocol\In

Registry Key	Type	Default	Description
BCC	STRING	"BCC:"	Indicator of BCC-recipients (*)
CC	STRING	"CC:"	Indicator of CC-recipients (*)
Coding	STRING	""	Coding type how TC/LINK-WM delivers SMS to TCOSS. "" - The default (void) decodes the received message and creates the KCS message accordingly PDU-NAT - The PDU string as received by the modem of the GsmBox is put to the text part of the KCS message; additionally the text of the PDU is interpreted for subject and recipient
DefRecipient	STRING	"Postmaster"	Default recipient if non is specified
DefRecipientService	STRING	"TOPCALL"	Service of the default recipient
GsmConcatenateWaitTime	DWORD	600	This time in seconds defines the maximum wait time for separated parts of a GSM concatenated SMS message. If the parts arrive in time, the message will be put together and forwarded as one message to KCS; if not, the arrived message parts will be processed with the note "Message part missing".
MDDir	STRING	"C:\TCOSS\MDDir"	The directory where incoming messages are stored before proceeded by TC/LINK-MD (TC/LINK-MD only). Each instance of the link must have a separate dedicated folder.
MDDirTcossFolder	STRING		The name of a KCS user, in whose message folder parallel link instances can temporarily store separated parts of a GSM concatenated message (TC/LINK-MD only).
RequestNonDel	DWORD	1	Setting this value to 0 disables sending of non-deliveries for incoming SMS (so no unanticipated costs can occur)
SepRecipients	STRING	","	Separator if sending "To", "Cc" or "Bcc" more than one recipient
SMSDir	STRING	"C:\TCOSS\SMSDir"	The directory where incoming messages are stored before proceeded by TC/LINK-WM (TC/LINK-WM only).
SubjectLength	DWORD	128	For the subject of the KCS message either the first here defined characters are used, or the characters until the first line break

Registry Key	Type	Default	Description
TO	STRING	"TO:"	Indicator of recipients (*)
ToChar	STRING	"#"	Short key for "TO:"

(*) The recipient type indicators are case insensitive.

Settings for Outgoing SMS

The following parameters are only for outgoing messages: HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKxx\Protocol\Out

Registry Key	Type	Default	Description
AlwaysOriginator	DWORD	0	If not zero, the originator-information is sent with each SMS (assuming that MaxNumberSMS is >1 and the message exceeds MaxLengthSMS)
CRLFCharacter	DWORD	10	The here configured character substitutes the carriage-return line-feed character pair of an outgoing SMS. So per default the line break is reduced to a carriage return. This helps to ensure that no character space is wasted and is in accordance with GSM standards. If 0, carriage-return line-feed pairs are not substituted.
From	STRING	"#"	Indicator of KCS originator at messages received by a mobile phone
GsmConcatenate	DWORD	0	KCS splitting (message starts: 1/2) GSM splitting (messages are put together by the mobile)
IntAreaCodeSMSC	STRING	""	International area code of the SMS-Center. For the GSM operator Swisscom this would be the area code of Switzerland: "41". This key should not be used anymore, use NumberDigitsForCorr instead. (TC/LINK-MD only)
LatestDelivery	DWORD	86400	Relative latest delivery time in seconds. It is recommended to set it at least to 3600 (one hour). An absolute latest delivery time is calculated, and if the local SMSC time is later, the message is rejected. See also section Default for Latest Delivery . (TC/LINK-MD only)
MaxLengthSMS	DWORD	160	Maximum length of one short message
MaxNumberSMS	DWORD	1	Maximum number of SMS sent per message; values between 1 and 20 are allowed
NumberCharRemove	STRING	"-_ ,:*~^()=#<>"	The characters of that string are regarded as fillers to make a number more readable and will be removed from the recipient number of outgoing messages. If additional characters are found in the number beside those defined in NumberCharSet, the message will be rejected.
NumberCharSet	STRING	"+0123456789"	Characters that are accepted in a number for an outbound message. Additionally a '*' in front will be regarded like the '+' as international prefix.

Registry Key	Type	Default	Description
NumberDigitsForCorr	DWORD	6	Notifications are correlated by timestamp and by the destination address. This key defines how many of the last digits of the destination number are used. If set to 0, the full number is used. This is not recommended, as the format (national/international) of the number returned with the notification is not known.
OriginatorFullName	DWORD	0 (false)	If not zero, the full name of the originator is sent instead of the KCS User-ID after the From-Indicator
OriginatorLength	DWORD	15	Maximum length of originator displayed at mobile phone (without From-Indicator)
OriginatorUntil	STRING	"@"	The originator name/address is only displayed until this character (excluding)
ReplaceIntPrefix	STRING	"00"	The international prefix '+' will be replaced by these characters in the recipient number. (TC/LINK-MD only)
ReplyAddressDefault	STRING	""	The number that is set as originating address for the SMS. The recipient will be able to send replies to this number. (TC/LINK-MD only)
ReplyAddressService	STRING	"SMSCOUT"	If the originator has an address defined for this service, this number will be taken as originating address. (TC/LINK-MD only)
ResetRetriesOn MessageFailure	DWORD	0	0 - KCS is informed of Message Failure immediately 1-5 - Number of resets and send retries before Message Failure (break code 2) is reported (TC/LINK-WM only)
RetriesOn MessageFailure	DWORD	2	0 - KCS is informed of Message Failure immediately 1-20 - Number of immediate send retries before Message Failure (break code 2) is reported (TC/LINK-WM only)
SepOriginatorSubject	DWORD	32 (blank)	Separator between originator and subject. *)
SepOriginatorSubjectLong	STRING	""	Additional characters between SepOriginatorSubject and the subject text.
SepSubjectText	DWORD	10 (carriage return)	Separator between subject and text-body. *)
SepSubjectTextLong	STRING	""	Additional characters between SepSubjectText and the subject body.
SmsPrefix	STRING	""	This string is set at the beginning of each SMS. Some SMS-Centers accept commands at the beginning of the SMS.
SubjectLength	DWORD	128	Length of subject for outgoing SMS. 0 means that no subject is used at all.
ValidityPeriod	DWORD	0	Defines a period for which a sent SMS remains active. This key is only used if latest delivery time is also configured in KCS. Between the ValidityPeriod and latest delivery time in KCS, the larger value defines the validity period of a sent message.

*) This is an ASCII value in order to support also non-displayable characters. Typically use 32 for blank or 10 for carriage return.

TC/LINK-WM Specific Settings

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKWM\Protocol

Registry Key	Type	Default	Description
GsmBoxAddress	STRING		IP Address or Name of GSM Interface
GsmBoxEncryption	DWORD	0	Encryption mode (Model305 only). Model305 can be configured to use encryption. TC/LINK-WM can support this the following ways: 0 - Detect Model305 encryption setting automatically 1 - Never use encryption 2 - Always use encryption
GsmBoxPinCode	STRING		PIN Code of the SIM Card of the GSM Interface; it is possible to set the Pin in plain text; after startup the Pin is checked and stored encrypted.
GsmBoxPort	DWORD		Port number of the GSM Interface. Depending on the GSM box type, the following port numbers are possible: GSM Box - V1 23 (Telnet port) Model305 GSM - 5004 (first GSM channel), 5005, 5006, or 5007 Model350 - 5004 Model360 - 5004 1)
GsmBoxResetPort	DWORD	9084	Port of GSM Interface for reset (GSM Box V1 and Model360)
GsmBoxType	DWORD	1	Type of the GSM Interface. The following types are possible: 1 - TC GSM Box V1 (the classic solution until 2005) 3 - TC Model305 GSM (up to four GSM channels) 4 - TC Model350 GSM (compact, single GSM channel) 5 - TC Model360 SMS (compact, single GSM/UMTS channel)
GsmBoxMode	DWORD	0	Command to set the communication method with the SMS network (only for Model360). Following options are possible: 0 - Select communication mode automatically 2) 1 - Enforce GSM mode only 2 - Enforce UMTS mode only
SmscNumber	STRING		Number of the network operators SMS-Center (starting with the InternationalPrefix). Typically you can leave this field empty. In this case the preconfigured SMS-Center number on the SIM-card is used.

1. Model 360 uses the additional port 30704 for reset during connection. See chapter [TC GSM Box Parameters](#)
2. The used mode can be found in the TC/LINK-WM trace file as shown in the examples below:
 - Mobile access technology is GSM (2G).
 - Mobile access technology is UMTS (3G).

TC/LINK-MD Specific Settings

This section describes TC/LINK-MD specific settings.

KCS UCP Specific Settings

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol

Registry Key	Type	Default	Description
AddressLRAd	STRING	""	Last Resort Address. IP and Port that has to be sent with each SM in the UCP LRAd field. (*)
AddressNAdC	STRING	""	Notification Address Code. IP and Port that has to be sent with each SM in the UCP NAdC field. (*)
ApiConfigFile	STRING	"C:\tcoss\tclp\SmscApiConfig.txt"	Configuration file of the SMSC UCP API (KCS UCP Integration only)
AuthenticationMode	DWORD	1	1: Use the SCShortID (if configured) to send a UCP60 command at startup. 0: Use the SCShortID to fill the UCP51 parameter "Authentication Code" for each sent SMS.
Listener1	STRING	""	IP and Port for listening to incoming UCP connections. (*)
Listener2	STRING	""	Additional IP and Port for listening to incoming UCP connections. (*)
SCAddressIn1	STRING	""	Primary address for receiving SMS (*). The In-connections will not be used for sending and are only necessary if an own connection is requested by the operator for incoming SMS.
SCAddressIn2	STRING	""	Secondary address for receiving SMS (*)
SCAddressOut1	STRING	""	Primary address for sending SMS (*)
SCAddressOut2	STRING	""	Secondary address for sending SMS (*)
SCPassword	STRING	""	Password for the SMS-Center Large Account
SCShortID	STRING	""	Identifier of the SMS-Center Large Account as provided from the GSM operator. If it is set to an empty string, the authentication will be skipped (the configuration for the Sonera Content Gateway).
TimeoutSmscEvent	DWORD	15000	Timeout in milliseconds for replies from the SMS-Center.
Ucp31AdC	STRING	"0"	Address Code as required by the UCP 31 alert command
Ucp31Pid	STRING	"0639"	Protocol Identifier as required by the UCP 31 alert command
Ucp31Support	DWORD	0	If set to 1, the UCP31 alert command is sent each pollcycle with the parameters configured by Ucp31AdC and Ucp31Pid

(*) TCP/IP Addresses of the SMS-Center consist of the IP-Address and the Port-Number separated by a colon, e.g.: "123.45.67.89:1234".

TC/LINK-MD uses the primary addresses to establish connections to the SMS-Center. The secondary addresses are only used if the connection to the primary address fails. Only the connection to the Out-Address is used for messages from KCS to the SMS-Center, but both connections are capable of receiving messages from the SMS-Center. In most cases, if you get only one single SMS-Center address, it is sufficient to specify this address as SCAccessOut1.

TOPS Integration Specific Settings

The following parameters are only for the TOPS Integration. The TOPS Integration is used if the registry key "...Protocol\Operator0\Protocol" exists and is not an empty string. In this case the above described keys "ApiConfigFile" and the keys starting with "SC" will not be used.

With the TOPS Integration you can configure up to 10 connections to operators, defined by the sub-keys "Operator0" – "Operator9". Depending on the used SMS-Center protocol (one of UCP, SMPP, SEMA, CIMD2) the configuration possibilities are different.

Only the registry sub-tree "Operator0" is written by setup. Additional connections (registry sub-trees Operator1 – Operator9) have to be configured in the registry manually. To do this first specify the protocol (in registry key...TCLINKMD\Protocol\Operator; the next void operator sub-key is always created) and then restart TC/LINK-MD. The registry keys for the additional connection will be created; you can easily configure them now. Then restart TC/LINK-MD again.

Configurations are read starting with "Operator0" as long as the key "Protocol" exists and is not an empty string.

The connection defined by Operator0 is the default connection used for sending. To see how to use another connection please see the section on routing.

There is no restriction regarding different operators using the same protocol.

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol\OperatorX

Registry Key	Type	Default	Description
Name	STRING	""	SMS-Center operator name. This name is only used for trace output.
Protocol	STRING	""	Protocol of SMS-Center operator; possible values: UCP, CIMD2, SEMA, SMPP
ShortId	STRING	""	SMSC operator Short-ID
Password	STRING	""	SMSC operator password for Short-ID
ShortId2	STRING	""	SMSC operator Short-ID for 2nd addresses (SMPP only) – only used if not empty
Password2	STRING	""	SMSC operator password for Short-ID for 2nd addresses (SMPP only) – only used if not empty
AddressIn1	STRING	""	IP and Port address defining the connection for incoming messages. The In-connections will not be used for sending and are only necessary if an own connection is requested by the operator for incoming SMS.

Registry Key	Type	Default	Description
Name	STRING	""	SMS-Center operator name. This name is only used for trace output.
AddressIn2	STRING	""	Address for secondary in-connection. This address will only be used if the connection to AddressIn1 fails.
AddressOut1	STRING	""	IP and Port address defining the connection for outgoing messages.
AddressOut2	STRING	""	Address for secondary out-connection. This address will only be used, if the connection to AddressOut1 fails.
OnFailureIdleMode	DWORD	1	If 1 the general link will enter idle mode when a connection fails. If 0, the special tcldm.dll will try recovering the connection each poll cycle. Other connections will be kept alive.
TopsEncoding	DWORD	0	Encoding of the SMS as described for the "EncodingEnum" type in the the TOPS SMSC client .NET documentation; typically it is not necessary to change this parameter.
TopsExtendedParameters	STRING	""	ExtendedParameters parameter as described by the TOPS SMSC client .NET documentation. E.g.: "smpp.packto7bit=1".
TopsKeepAliveInterval	DWORD	10	Value in seconds denoting time interval between packages keeping the connection alive. Should be set according to SMSC operator's instructions. If zero, no keep alive packages are sent.
TopsResponseTimeOut	DWORD	10	Value in seconds denoting maximum wait time for response from the SMS-Center
TlsProtocols	DWORD		<p>This is only applicable for UCP and SMPP. Set this key to blank, or use one or a combination of the following protocols to enable:</p> <ul style="list-style-type: none"> • ssl20: To enable SSL protocol version 2.0 • ssl30: To enable SSL protocol version 3.0 • tls10: To enable TLS protocol version 1.0 • tls11: To enable TLS protocol version 1.1 • tls12: To enable TLS protocol version 1.2 <p>If you leave the value of <code>TlsProtocols</code> key as blank, TLS will not be enabled.</p> <p>Examples:</p> <ul style="list-style-type: none"> • To support TLS protocol version 1.2, set the value of <code>TlsProtocols</code> to "tls12". • To support SSL protocol version 3.0 and TLS protocol version 1.2, set the value of <code>TlsProtocols</code> to "ssl30:tls10".
UseTLS	STRING	0	To enable TLS support, set the value to 1. This is only applicable for UCP and SMPP.

TOPS UCP Specific Operator Settings

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol\OperatorX

Registry Key	Type	Default	Description
UcpListener	STRING	""	IP and Port for listening to incoming UCP connections, consisting of the IP-Address and the Port-Number separated by a colon, e.g.: "123.45.67.89:1234".
UcpAuthTON	DWORD	6	Type of Number identifier for authentication. Set according to GSM operator instructions.
UcpAuthNPI	DWORD	5	Numbering plan identifier for authentication. Set according to GSM operator instructions.
UcpListener	STRING	""	
UcpTempDelayReturns	STRING	"-2;-1"	If sending an SMS fails, the here defined return values of the TOPS SDK are interpreted as temporary delays (like IP-connection failed, SMS-Center congestion). In this case break code 2 is returned to KCS and the KCS retry schema applies. On other failure return codes the message is terminated.

(*) TCP/IP Addresses of the SMS-Center consist of the IP-Address and the Port-Number separated by a colon, e.g.: "123.45.67.89:1234".

TOPS SMPP Specific Operator Settings

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol\OperatorX

Registry Key	Type	Default	Description
SmppAsyncMode	DWORD	0	Possible values: 0 - No asynchronous sending 1 - Asynchronous sending only for GSM concatenated SMS (GsmConcatenate=1, MaxNumberSMS>1) 2 - Asynchronous sending for all messages Note: Also if set to 2 TC/LINK-MD will wait after each sent SMS for the acknowledgment; only concatenated messages are sent as bulk and TC/LINK-MD waits afterwards for the acknowledgement of the last SMS.
SmppAuthNPI	DWORD	1	Numbering plan identifier for authentication. Set according to GSM operator instructions.
SmppAuthTON	DWORD	1	Type of Number identifier for authentication. Set according to GSM operator instructions.
SmppBindAddressRange	STRING	""	Range of short numbers serviced by account. Set according to GSM operator instructions.
SmppBindMode	STRING	"Transceiver"	SMPP Bind Mode. If this value is set to "Transceiver", all connections will bind as "Transceiver". Else outgoing connections will be set to "Transmitter" and incoming to "Receiver". In this case you need an incoming connection for inbound SMS and status reports!
SmppDestNPI	DWORD	1	Numbering plan identifier for the recipient. Set according to GSM operator instructions.
SmppDestTON	DWORD	1	Type of Number identifier for the recipient. Set according to GSM operator instructions.

Registry Key	Type	Default	Description
SmppNotifCorrMode	DWORD	0	The Operator Netsize returns the immediate correlation information in decimal, and later in hexadecimal format. Setting this key to 1 handles this anomaly.
SmppOrigNPI	DWORD	1	Numbering plan identifier for the originator. Set according to GSM operator instructions.
SmppOrigTON	DWORD	1	Type of Number identifier for the originator. Set according to GSM operator instructions.
SmppServiceType	DWORD	0	Depending on this configuration the SMPP parameter "service_type" is set when sending an SMS: 0 - "service_type" is always set to empty (default) 1 - "service_type" is set to the value of the TCSI message parameter configured by SmppServiceTypeTcParam
SmppServiceTypeTcParam	STRING	"un_content/0/set_entry_rs_originator/ts_deptm"	TCSI message parameter path for the SMPP "service_type". The "service_type" will be set to the value of this parameter. (*)
SmppSystemType	STRING	""	Type of System identifier. Set according to GSM operator instructions.
SmppTempDelayReturns	STRING	"-2;-1"	If sending an SMS fails, the here defined return values of the TOPS SDK are interpreted as temporary delays (like IP-connection failed, SMS-Center congestion). In this case break code 2 is returned to KCS and the KCS retry schema applies. On other failure return codes the message is terminated.
SmppVersion	DWORD	3	Version of the SMPP protocol implementation.

(*) Possible settings for "SmppServiceTypeTcParam" are the string values shown in the "MailDebug" trace of the message objects "set_entry_ms_mail", "set_header", "set_entry_rs_originator".

Examples:

- ts_ref Subject
- un_content/0/ts_cost_center Cost center
- un_content/0/set_entry_rs_originator/ts_recp_id User-id of the originator
- un_content/0/set_entry_rs_originator/ts_deptm Department of the originator

TOPS SEMA Specific Operator Settings

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol\OperatorX

Registry Key	Type	Default	Description
SemaAuthTON	DWORD	6	Type of Number identifier for authentication. Set according to GSM operator instructions.
SemaAuthNPI	DWORD	5	Numbering plan identifier for authentication. Set according to GSM operator instructions.

Registry Key	Type	Default	Description
SemaTempDelayReturns	STRING	"-2;-1;2;3"	If sending an SMS fails, the here defined return values of the TOPS SDK are interpreted as temporary delays (like IP-connection failed, SMS-Center congestion). In this case break code 2 is returned to KCS and the KCS retry schema applies. On other failure return codes the message is terminated.

TOPS CIMD2 Specific Operator Settings

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol\OperatorX

Registry Key	Type	Default	Description
Cimd2TempDelayReturns	STRING	"-2;-1;4;5"	If sending an SMS fails, the here defined return values of the TOPS SDK are interpreted as temporary delays (like IP-connection failed, SMS-Center congestion). In this case break code 2 is returned to KCS and the KCS retry schema applies. On other failure return codes the message is terminated.

Registry Keys Before TC/LINK-WM 2.06.00 and Their New Equivalents

The configuration parameters of the registry were changed since TC/LINK-WM version 2.06.00. Both the setup and the module (tclmd.dll) are capable of updating the parameters automatically. The old parameters are saved to the registry sub-tree ... \TCLINKWM\Protocol_Old and replaced in the sub-key \TCLINKWM\Protocol by their new equivalents. See the following tables on the changes.

Obsolete Registry Keys/New Equivalents (Both Directions): HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKWM\Protocol

Registry Key	Type	New Registry Key	Type	Default Value
ConfigPort	DWORD	-	-	-
General\CostsPerRecipients	DWORD	CostsPerSMS	DWORD	0
InternationalPrefix	STRING	InternationalPrefix	STRING	"+"
LenNr	STRING	-	-	-
NetNameTCWL	STRING	GsmBoxAddress	STRING	
OwnService	STRING	OwnService	STRING	"SMS"
PinCode	STRING	GsmBoxPinCode	STRING	
Port	DWORD	GsmBoxPort	DWORD	23
Provider	STRING	-	-	-
ResetPort	DWORD	GsmBoxResetPort	DWORD	9084
SeparatorServiceFreeText	STRING	-	-	-

Registry Key	Type	New Registry Key	Type	Default Value
SMSC_Nr	STRING	SmscNumber	STRING	
TestCircleAT	DWORD	-	-	-

Obsolete Registry Keys/New Equivalents (Inbound: GSM to KCS): HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKWM\Protocol

Registry Key	Type	New Registry Key	Type	Default Value
Bcc	STRING	In\Bcc	STRING	"Bcc:"
Cc	STRING	In\Cc	STRING	"Cc:"
DefaultRecipient	STRING	In\DefRecipient	STRING	"Postmaster"
DefaultService	STRING	In\DefRecipientService	STRING	"TOPCALL"
IncomingSubjectLength	DWORD	In\SubjectLength	DWORD	128
SeperatorRecipients	STRING	In\SepRecipients	STRING	","
SMSDir	STRING	In\SMSDir	STRING	"C:\TCOSS\SMSDir"
To	STRING	In\To	STRING	"To:"
ToChar	STRING	In\ToChar	STRING	"#"

Obsolete Registry Keys/New Equivalents (Outbound: KCS to GSM): HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKWM\Protocol

Registry Key	Type	New Registry Key	Type	Default Value
AlwaysOriginator	DWORD	Out\AlwaysOriginator	DWORD	0
FromChars	STRING	Out\From	STRING	"From:"
MaxLengthOfEachMsg	DWORD	Out\MaxLengthSMS	DWORD	160
MaxNrSMSperMsg	DWORD	Out\MaxNumberSMS	DWORD	1
OrigFullName	DWORD	Out\OriginatorFullName	DWORD	0 (false)
OrigLen	DWORD	Out\OriginatorLength	DWORD	15
SeperatorOrig2Txt	STRING	Out\SepOriginatorSubject	DWORD	32 (blank)
SepOrig2TxtAscii	MULTISTRING	Out\SepOriginatorSubject	DWORD	32 (blank)
SepOrigAtAt	DWORD	Out\OriginatorUntil	STRING	"@"
ResetRetriesOnMessageFailure	DWORD	Out\ResetRetriesOnMessageFailure	DWORD	0
RetriesOnMessageFailure	DWORD	Out\RetriesOnMessageFailure	DWORD	2
SepSubject2Text	MULTISTRING	Out\SepSubjectText	DWORD	32 (blank)
SmsPrefix	STRING	Out\SmsPrefix	STRING	""

Configuration Details

This section describes the configuration details.

Tracing

The following trace settings are recommended for TC/LINK-WM (MD)

HKLM\Software\Topcall\TCLINKxx\General\Tracelevel

10	Normal operation trace (default)
100	Debugging trace
255	Debugging trace with function calls

Maximum Number of SMS per KCS Message

It is possible to split one KCS message to more than one SMS if the length exceeds the value specified in “HKLM\Software\Topcall\TCLINKxx\Protocol\Out\MaxLengthSMS” (default value: 160). Words at the end of one SMS are wrapped thus no words are cut, except those longer than 20 characters.

The maximum number of short messages to be sent is defined with the registry key “HKLM\Software\Topcall\TCLINKxx\Protocol\Out\MaxNumberSMS”. This key can have the following values:

1	One SMS is sent per message (default)
2 – 20	Maximum number of short messages sent per KCS message

GSM Concatenated Messages

Beside the KCS method of splitting messages to multiple SMS it is also possible to send concatenated messages according to the GSM standard (the splitting information is part of the UDH – User Data Header). In order to use this feature you have to set the registry key “HKLM\Software\Topcall\TCLINKxx\Protocol\Out\GsmConcatenate” to 1.

Advantages:

- The message is put together and shown as one on the mobile. So the splitting is transparent to the user.
- There is no bottom-up problem with the split messages because the newest is shown as the first on some mobiles.
- No message capacity is wasted because words are kept together.

Prerequisite/Restrictions:

- The mobiles have to support assembling of concatenated SMS (most mobiles do that now). Else the message parts are again shown each without being put together.
- As the mobiles have varying storage capacity, they support different maximum concatenated message parts. Typically, if this maximum is reached, they show the remaining part as new short message. So

it is not recommended to allow this splitting to more than three short messages (registry key HKLM\Software\Topcall\TCLINKxx\Protocol\Out\MaxNumberSMS <= 3).

Always Specifying the Originator

Maybe you want all short messages sent having their header embedded. If you want this you can set the registry key “HKLM\Software\Topcall\TCLINKxx\Protocol\Out\AlwaysOriginator” to unequal 0.

Example: Three short messages have to be sent.

Normally (AlwaysOriginator=0) TC/LINK-WM (MD) would send:

First SMS:

```
1/3 From TM: long text ...
```

Second SMS:

```
2/3 next part of the long text ...
```

Third SMS:

```
3/3 last part of the long text
```

If this key is set to anything unequal 0 the following will happen:

First SMS:

```
1/3 From TM: long text ...
```

Second SMS:

```
2/3 From TM: next part of the long text ...
```

Third SMS:

```
3/3 From TM: last part of the long text
```

Searching for Inactive Recipient Addresses

TC/LINK-WM (MD) can be configured to use proxy addresses (of a configured service) for sending to KCS users. This makes it easier to send to users with long KCS User-IDs, e.g. shadow users created by Dirsync. (Nevertheless it is also possible to send to KCS User-IDs. The described method is only an alternative if the KCS User-IDs are too long to type on a mobile.)

Installation:

- Run Kofax Communication Server setup. Make sure that the checkbox “Configure Advanced Features” on the first links configuration screen (“Basic parameters for ALL selected links”) is selected.
- Enable automatic creation of KCS dependencies via the checkbox “Create Dependencies on KCS server” on the “Advanced link specific parameters” page.
- On the second page of TC/LINK-WM (MD) parameters, specify a name for “Service for Inbound Routing” (e.g. “SMSIN”). This value is configurable after installation by the Registry Key “Topcall\RoutingService”
- When TC/LINK-WM (MD) starts the next time, it creates a user “postmaster” and a service with prefix “postmaster:” and the name defined in Setup.

- You can now add an inactive address (with the service specified in Setup, and a short address string) to a KCS user profile. For example, give the user “Testuser with a very long name” an inactive address with service “SMSIN” and address string “test1”.
- With KCS server version 7.08.00 or higher, add 2 lines to the KCS file rr99 (section INBOUND):

```
**INBOUND
postmaster:~, ,search for aliases; non-matching to postmaster!
, , no default required because prefix already is existent user
```

Please refer to the TC/SP 7.08.02 release description for details!

For sending an SMS message “this is the message text” to this user, type:

```
#test1 this is the message text
```

Syntax Check of Number for Outgoing SMS

For SMS messages that are sent via TC/LINK-WM (MD) a syntax-check of the number is done.

The following characters (the first is a blank), that are supposed to make a telephone-number more readable, are removed before the message is sent to the GSM operator (configurable in the registry with the key HKLM\Software\Topcall\TCLINKxx\Protocol\Out\NumberCharRemove):

```
- _ , | ; : * ~ / \ ( ) = $ # < >
```

The following characters are allowed in the number (registry HKLM\Software\Topcall\TCLINKxx\Protocol\Out\NumberCharSet):

```
+0123456789
```

The * on the first position will be regarded as indicator for an international number and be replaced by the + symbol. After that the syntax check is performed. A message with a number that contains other characters than of these two sets will be terminated negatively by TC/LINK-MD and no more send attempts will be done.

Separator Configuration Example

The following is an example of how the separator parameters can be used:

- HKLM\Software\Topcall\TCLINKxx\Protocol\Out\From = “From: “
- HKLM\Software\Topcall\TCLINKxx\Protocol\Out\SepOriginatorSubject = 10
- HKLM\Software\Topcall\TCLINKxx\Protocol\Out\SepOriginatorSubjectLong = “Subject: “
- HKLM\Software\Topcall\TCLINKxx\Protocol\Out\SepSubjectText = 10
- HKLM\Software\Topcall\TCLINKxx\Protocol\Out\SepSubjectTextLong = “Text: “

This configuration leads to the following short messages:

```
From: <user>
Subject: <subject text>
Text: <body text>
```

Cost Accounting for SMS

It is possible to account costs for each send short message. If the registry-value “HKLM\Software\Topcall\TCLINKxx\Protocol\CostsPerSMS” is set to > 0 this value will be accounted per SMS sent to the SMSC. If this registry-value is set to 0 no cost accounting will be done.

Command for SMS-Center in Each SMS

Some SMS-Centers accept commands at the beginning of the SMS message text. For example, a Swedish GSM-operator lets you hide the reply number when putting “*HN#” at the beginning of an SMS. The command “*HN#” is removed from the delivered SMS.

You can configure this for all outgoing SMS with the registry key “HKLM\Software\Topcall\TCLINKxx\Protocol\Out\SmsPrefix”. The text defined with this key will be put before each SMS message text. The maximum command length is restricted to 30 characters.

Correlation of Notification with Last Digits of Destination Number

The registry key “HKLM\Software\Topcall\TCLINKxx\Protocol\Out\NumberDigitsForCorr” defines how many of the last digits of the destination number should be used for correlating a notification to the original message.

The original method of using the whole number makes problems, as the format of the number (national/international) can change.

If the registry key “HKLM\Software\Topcall\TCLINKxx\Protocol\Out\IntAreaCodeSMSC” is set to an empty string, the default value will be 6, else it will be set to 0. This is for installations that use the “HKLM\Software\Topcall\TCLINKxx\Protocol\Out\IntAreaCodeSMSC” configuration successfully.

Note If this configuration is changed, messages will not be terminated correctly that are waiting for a notification at the moment the configuration is changed!

Background

Here is described how using the registry key IntAreaCodeSMSC works. This method is not recommended anymore, as different SMSC-types and GSM-operators behave differently.

For correlating notifications with the original message the SMS-Center timestamp (Date and Time) and the recipient number are used. This works fine with Swisscom as operator if international numbers like “+43676...” or “0043676...” are used for international messages (messages that are sent from the location of the SMS-Center to foreign countries) and if numbers like “0676...” are used for national messages (messages from the SMS-Center to a mobile registered in the same country).

However there is a problem (at least with Swisscom as operator) if international numbers are used to address a national, in this case a Swiss mobile phone. Then the message is sent to a number like “004179...”, but the notification comes back with the number “079...”, and the matching to the original message fails, the send order remains open.

In order to avoid this problem, TC/LINK-MD can change the international addressing to a national addressing if the SMS has a national destination. To be able to distinguish between an international and a national message, the international area code of the SMS-Center has to be configured.

In the above example the SMS-Center of Swisscom is used, so all mobile numbers of Switzerland are national destinations, and any international addressing to these numbers has to be translated to the national one. This means that all numbers starting with “+41” or “0041” have to be changed to starting with “0”. The registry key HKLM\Software\Topcall\TCLINKxx\Protocol\Out\IntAreaCodeSMSC defines which numbers TC/LINK-MD has to change. For Swisscom as GSM operator this has to be set to “41”, the Swiss international area code.

Default for Latest Delivery

A registry key “HKLM\Software\Topcall\TCLINKMD\Protocol\Out\LatestDelivery” allows setting a relative latest delivery time for short messages from KCS. This time is only used if the latest delivery time of the KCS message is not set. If the key is zero, then the GSM message is sent without latest delivery time.

Using this method to set the latest delivery time has a drawback: The termination of the message on KCS depends on the correct reception of the delivery notification from the SMSC. If for some reason this notification does not come, the message will remain unterminated, as KCS does not know of this latest delivery timeout. It is recommended to set an appropriate message timeout in the template used by the incoming TC/LINK, where the SMS originally comes from (LN, MX,...). That way KCS can terminate the messages itself.

This key is not created automatically by TC/LINK-WM/MD.

Latest Delivery is not supported for CIMD2 or SEMA.

Validity Period for Messages

TC/LINK-WM (MD) allows setting the validity time (in seconds) for outgoing short messages from Kofax Communication Server. These messages remain active for the defined time period.

The registry key “HKLM\Software\Topcall\TCLINKWM\Protocol\Out\ValidityPeriod” allows setting this time (in seconds). Default value for this key is 0. For an SMS, the ValidityPeriod key is only used, if the latest delivery time is configured in Kofax Communication Server.

Between the ValidityPeriod key and latest delivery time in TCfW, the larger value defines the validity period of an outgoing SMS. For example, if the **Set Date And Time For Latest Delivery** field in **Send Option** window of TCfW is configured as **Tuesday, April 06, 2018 11:00:00** and the ValidityPeriod key is set to 7200. When a SMS is sent on **April 6, 2018 09:30:00**, it uses the value configured in the ValidityPeriod key and the SMS remains active till **April 6, 2018 11:30:00**.

Configuration Details (TC/LINK-WM Only)

This section describes TC/LINK-WM specific configuration details.

Retry Configuration for Outgoing Messages

The registry-key “HKLM\Software\Topcall\TCLINKWM\Protocol\RetriesOnMessageFailure” makes it possible to configure TC/LINK-WM to retry sending a message that caused an error of the modem. This behavior confirms for errors that are regarded as GSM provider problems, especially because of congestion.

If the key is 0, no retries are attempted. If the key is greater than 0, the link tries to resend the same message as often as specified with the key. After that TC/LINK-WM returns break code 2, and KCS will retry to send the message according to configuration of config-line 44. (The default of config-line 44 on KCS is '87654321-', so resend retries will be done forever, assuming that the GSM-provider will solve his problems sooner or later).

“HKLM\Software\Topcall\TCLINKWM\Protocol\ResetRetriesOnMessageFailure” does the same as described above, but additionally the LAN-interface of the TC GSM Box is reset and the GSM-modem is initialized. This can take up to some minutes and is not recommended for normal operation.

TC Model305 GSM Specialties

The TC Model305 GSM supports up to four GSM channels. You can put two SIM cards on each of the two TC25 interfaces. To connect all of the four GSM channels you need four TC/LINK-WM instances.

Ports

Each TC/LINK-WM instances will have to connect to the same IP address (that of the Model305 GSM), but to different ports (5004-5007). The ports are assigned to the SIM card positions the following way:

5004	S0/A
5005	S0/B
5006	S1/A
5007	S1/B

Encryption

On Model305 GSM you can configure to use encryption or not only once for all installed GSM channels. TC/LINK-WM however lets you configure encryption for each instance; nevertheless this has to be the same for all instances connecting to the same Model305 GSM.

The default TC/LINK-WM configuration automatically lets you detect what mode is configured on Model305 GSM. Additionally you can force TC/LINK-WM to never or to always use encryption. In this case TC/LINK-WM will fail to work if Model305 GSM is configured the other way.

Configuration Details (TC/LINK-MD Only)

This section describes TC/LINK-MD specific configuration details.

SMS Inbound Routing via Recipient Number

TC/LINK-MD can be configured to use proxy addresses (of a configured service) for sending to KCS users. The recipient number of the incoming SMS is used to find a matching KCS user. If no user is found, the SMS is delivered to a special postmaster user.

Note This is only possible when using TC/LINK-MD. When using TC/LINK-WM, the GSM protocol does not deliver the recipient number – as the number of the SIM card is fixed assigned.

Installation

- Set the registry key “Topcall\RoutingService” = “SMSCOUT” (or to some other service – however it makes sense to use the same service as used for setting the number of outgoing SMS)
- Set the registry key “Protocol\In\RoutingType” = 1
- Create a user “postmaster” with the TOPCALL address “postmaster”
- Create a service called “SMSCOUT” (or use existing), Type “Free Format”, Prefix “postmaster:”
- You can now add an inactive address (with the service specified, and the SMS recipient number) to a KCS user profile.
- Add 2 lines to the KCS file rr99 (section INBOUND):

```
**INBOUND
postmaster:~, ,search for aliases; non-matching to postmaster!
, , no default required because prefix already is existent user
```

Please refer to the *TCOSS System Manual* for details.

Configuration

Registry HKLM\Software\TOPCALL\TCLINKMD

Field	Type	Default	Description
TOPCALL\RoutingService	STRING	""	The inbound KCS routing service. Note: Here the same service as for “Protocol\Out\ReplyAddressService”, default “SMSCOUT” can be used.
Protocol\In\RoutingType	DWORD	0	Routing Types: 0 Classic (#UserId in SMS text) 1 Use recipient number 2 Use last part of recipient number (without “SCShortId”) – KCS UCP only

Examples

Configuration on TC/LINK computer, registry HKLM\Software\TOPCALL\TCLINKMD

Field	Example
TOPCALL\RoutingService	SMSCOUT
Protocol\In\RoutingType	1

KCS Users on KCS server

User	Address SMSCOUT
User1	4521010
User2	4521020
postmaster	

With above settings, SMS recipient addresses are matched to KCS recipients as shown in the following table:

Address Code (AdC)	KCS Recipient
4521010	User1
4521020	User2
4521030	postmaster

Configuration Details (TC/LINK-MD KCS UCP Only)

This section describes TC/LINK-MD KCS UCP specific configuration details.

Sending Notification Address with Short Message

The UCP protocol allows several methods for receiving status notifications from the SMS-Center.

SMS-Center Large Account and Short-ID

Each connection sends a special message (called UCP60 command). This message tells the SMSC to which Large Account (identified by Short-ID, Password) this connection belongs. When the SMSC wants to return a status notification, it knows what connections are available for that SMS-Center Large Account and chooses one to deliver the notification.

The advantages of this configuration are:

- It's easily possible to make it fail save. Multiple TC/LINK-MD instances on different computers can poll the same KCS queue and connect to the same SMSC using the same SMS-Center Large Account. If one Link fails, traffic and notifications are routed via the other instances.
- Connections are always built up and maintained by TC/LINK-MD. There are no connections coming from the SMSC to TC/LINK-MD. That means that on the customer site, where TC/LINK-MD is running, no special firewall configuration is necessary. It just has to allow the outgoing connection to IP and Port of the SMSC.

The drawback of this configuration is:

- Not all SMSC operators provide a SMS-Center Large Account, a Short-ID and this kind of handling of status notifications.

Sending Notification Address with Short Message

Another possibility is to send a notification address (IP and Port) with each SM. The UCP-field that is used for that is called NAdC. When the SMSC wants to return a status notification it builds up a connection to this address and sends the notification. At this address there has to be a TC/LINK-MD instance with a Listener configured.

Additionally it is also possible to send with each SM a second address called Last Resort Address (UCP-field LRAd). This address is used for a last delivery attempt after the notification is already expired. However, the SMSC needs a special license for using this address, and neither of the operators Sonera or Swisscom supports this.

The advantage of this configuration is:

- The SMSC does not have to support handling Short-IDs and matching connections to them.

The drawbacks of this configuration are:

- No real fail save configuration is possible. If the TC/LINK-MD instance of the NAdC is down, no notifications can be delivered and KCS messages remain un-terminated. The SMSC however should buffer these notifications and try to deliver them later.
- TC/LINK-MD has to accept incoming connections from the SMSC. That means the firewall of the customer has to be configured to allow and to route them correctly. When using the Sonera Content Gateway (UCP-tunneling) then this is not necessary.

Configuration

The following registry keys are available for this method:

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol

Registry Key	Type	Default Value	Description
AddressLRAd	STRING	""	Last Resort Address. IP and Port that has to be sent with each SM in the UCP LRAd field.
AddressNAdC	STRING	""	Notification Address Code. IP and Port that has to be sent with each SM in the UCP NAdC field.
Listener1	STRING	""	IP and Port for listening to incoming UCP connections.
Listener2	STRING	""	Additional IP and Port for listening to incoming UCP connections.

The IP and Port address have to be in the format "ip1.ip2.ip3.ip4:port", e.g.: 127.0.0.1:4711. Host names are not resolved and therefore not allowed. Due to an UCP restriction, the ports are only allowed to have four digits.

For the Listeners you have of course to use a valid local IP-address. The port addresses can be chosen randomly, but they must not be used by any other application on that computer.

When configuring the AddressNAdC or AddressLRAd, you also have to configure a Listener that receives UCP-messages at this address. However, this might also be another TC/LINK-MD instance on the same or another computer. You have to make sure the SMSC can connect to this address (firewall, routing).

The Listeners can be used for all kind of incoming UCP commands or messages.

SMSC API Configuration File

TC/LINK-MD uses the SMSC API of CMG to communicate with the SMS-Center (distributed as libsapi.dll in the c:\Tcross\Tclp directory). This API can be configured by the file SmscApiConfig.txt (also in the Link-Package directory).

The following SMSC API configuration file is distributed with TC/LINK-MD:

```
#
#   SMSC API 4.0 Configuration file
#
#   Copyright (C) Computer Management Group, 1998
#-----
#
#   Trace settings
#
[TRC]
# The name of the trace file is sx<yymmdd>.<seq>. For each day
# a new trace file will be written.
# Mode          Fatal, Warning, Error
# directory     c:/tcross/trace
# NrOfFiles     2          # no removal of old trace files
# LifeTime     2d          # or <x>h or <x>m or a combination of them
[CFG]
# CheckCfgTime 60          # every minute
[MTF]
# Message Translation Framework (MTF)
# Contains at this moment EMI only.
# The 'System' specification is used
# while reading the alphabet conversion file
# to determine the section to be utilised
BEGIN EMI
# System          PC
# AlphabetConversion c:\tcross\tclp\SmscApiConversion.txt
END
[ECV]
# Convert directive to be used for language translation only
# or if the ecv.out file is non existing
# Convert          ${HOME}/sapi/develop/etc/ecv.sorted ${HOME}/sapi/develop/etc/
# ecv.out
# Error2Text      ${HOME}/sapi/develop/etc/ecv.out
[CMM]
#
#   Retry scheme definitions to change the default for a network type
#
#
#   Static Connections
#
# default Access is TCP/IP
# default messaging protocol is CMG implementation of ERMES UCP
# default type is outbound connection
# default retry scheme is provided by the library itself (network type specific)
# default local port is zero i.e. let TCP/IP itself provide a local port number
#
BEGIN retry TC_RETRY_SCHEMA
# NrConnRetries  0
# ConnectTimeout 10000
# ReconnectTimeout 10000
# ReconnectDelay 2000
# InactivityTimeout -1
# InitialSendDelay 0
```



```

END
[NAF]
# we use only the TCP/IP network type
networks TCP/IP
#
# -- End of Configuration File -
#

```

UCP-31 Alert Command

The UCP-31 alert operation may be sent each poll cycle via both active connections as keep alive command. To activate this, set Ucp31Support = 1. Additionally you have to configure the parameters of this command as required by your SMS-Center operator: AdC (Address Code) and PID (Protocol Identifier).

If there is no positive result for the UCP-31 command, the connections are shut down and reinitialized. If this fails, TC/LINK is set to idle mode (this means TC/LINK is inactive and will try to reconnect by default every 10 poll cycles).

HKEY_LOCAL_MACHINE\Software\TOPCALL\TCLINKMD\Protocol

Ucp31AdC	STRING	"0"	Address Code as required by the UCP 31 alert command
Ucp31Pid	STRING	"0639"	Protocol Identifier as required by the UCP 31 alert command
Ucp31Support	DWORD	0	If set to 1, the UCP31 alert command is sent each pollcycle with the parameters configured by Ucp31AdC and Ucp31Pid

Example 1:

Ucp31Support	1	
Ucp31AdC	0100202270014711	IP and Port number 10.20.227.1 4711
Ucp31Pid	0539	PID value for PC application via TCP/IP

Example 2:

Ucp31Support	1	
Ucp31AdC	15099	Short ID of SMS-Center Account
Ucp31Pid	0639	PID value for PC application via abbreviated number

Note The TC/LINK poll cycle (registry key General\Pollcycle, default 30 seconds) should be shorter than the disconnect timeout of the SMS-Center. That way the connections stay open steadily.

Code Page Conversion

SMS messages typically are send using the GSM 7-bit code page. It is also possible to send Unicode character messages or binary messages.

Unicode Character Support

The GSM protocol allows sending Unicode characters (UCS-2) alternatively to the standard GSM 7-bit alphabet. In this case it is only possible to send 70 characters (instead of the 160 7-bit characters). This will allow using TC/LINK-WM (MD) in countries like China, Japan, Saudi Arabia... Of course, the mobile phones receiving the Unicode message will have to be able to display them correctly.

TC/LINK-WM (MD) will send in Unicode characters, if in the `GsmConversionFile` (registry `HKLM\Software\TOPCALL\TCLINKxx\Protocol\GsmConversionFile`) no conversion tables are found for the configured PC code page (registry `HKLM\Software\TOPCALL\TCLINKxx\General\PCCodePage`). The current `GsmConversionFile` provides only conversion tables for code page 1252, 1250, 1253 and 437, for all other configured PC code pages SMS will be sent in Unicode.

To configure TC/LINK-WM (MD) to send e.g. Chinese characters, you have to set both of the registry keys

- `HKLM\Software\TOPCALL\TCLINKxx\General\PCCodePage` and
- `HKLM\Software\TOPCALL\TCLINKxx\Topcall\CodePage` to 936.

This is not supported by setup.

GSM 7-bit Code Page (TC/LINK-WM and TC/LINK-MD TOPS Integration)

TC/LINK-WM uses the GSM conversion file for converting from the TC/LINK computer PC-codepage to the GSM codepage. For calculating the correct length of the short message TC/LINK-MD (TOPS Integration) uses the same GSM conversion file as TC/LINK-WM. The actual conversion is here performed by the TOPS library.

The used PC code page is defined by the registry key `HKLM\Software\TOPCALL\TCLINKxx\General\PCCodePage`.

For conversion between the PC code page and the GSM code page TC/LINK-WM (MD) uses the file `GsmConversionFile.txt` (as defined with the registry key `HKLM\Software\TOPCALL\TCLINKxx\Protocol\GsmConversionFile`) of the TC/LINK directory.

Four character set conversion tables are defined in the alphabet conversion file for each PC code page (e.g. 1252). To be able to transmit a message, the to-GSM (1252-GSM) character set conversion tables have to be defined. To be able to receive a message, the from-GSM (GSM-1252) character set conversion tables have to be defined.

In each of the sections in the alphabet conversion file, a character set conversion table is defined. Such a table consists of 16 rows and 16 columns. In this way, totally 256 elements can be specified. Each of these elements has to be separated by a comma and represents a hexadecimal number or a character.

To convert a certain character, the numeric value of a character is determined and is used as an offset in a character set conversion table to determine the corresponding converted value. E.g. to convert the '@' sign on a PC to the mobile's representation, first the value of the '@' sign is determined. Subsequently, this value is used in the 1252-GSM character set conversion table to retrieve the value of the corresponding element, in this case the 64th element. The value of the 64th element is 0x00 and will be substituted in the string for the '@' sign. If the value in the 1252-GSM table contains 0x1B (Escape) then the value will be taken from the 1252-GSM_EXT table. Example is the '€' sign, the ASCII value of the

Euro sign is 128 in Windows. The 128th element is 0x1B. Therefore table 1252-GSM_EXT will be used and the 128th element is 0x65 resulting in the output code of both 0x1B and 0x65 to the message.

For incoming messages the process is the reversed. If the message contains 0x1B then table GSM_EXT-1252 will be used for the conversion. Example message contains 0x1B,0x65. The 0x1B is found; therefore table GSM_EXT-1252 will be used. The 101st element in GSM_EXT-1252 is 0x80. This character will then be written to the incoming message.

For additional PC code pages, as defined with the registry key ...\\General\\PCCodePage, additional character conversion tables have to be defined in this file.

The conversion file distributed with TC/LINK-WM (MD) supports the code pages 1252, 1250, 1253 and 437. Here is the listing of the 1252 code-page conversions:

```
#
# File:
# GsmConversionFile.txt
# Version 1.00.00
#
# Description:
# Conversion tables for converting between PC Characters and GSM Characters
#
#####
# Windows PC
#
#####
[1252-GSM]
# MT message translation:
# ANSI character set to Mobile character set translation
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F
0xFF,0x01,0x02,0x03,0x06,0x06,0x60,0x60,0x60,0x60,0x0A,0x60,0x1B,0x0D,0x60,0x60, # 0
0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x1B,0x60,0x60,0x60,0x60, # 1
0x20,'!',0x22,0x23,0x02,'%','&',0x27,'(',')','*','+',',','-',',','/',' # 2
'0',0x31,'2','3','4','5','6','7','8','9',':',';','<','=','>','?',' # 3
0x00,'A','B','C','D','E','F','G','H','I','J','K','L','M','N','O', # 4
'P','Q','R','S','T','U','V','W','X','Y','Z',0x1B,0x1B,0x1B,0x1B,0x11, # 5
0x60,'a','b','c','d','e','f','g','h','i','j','k','l','m','n','o', # 6
'p','q','r','s','t','u','v','w','x','y','z',0x1B,0x1B,0x1B,0x1B,0x60, # 7
0x1B,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60, # 8
0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60, # 9
0x20,0x40,0x60,0x01,0x24,0x03,0x60,0x5F,0x60,0x60,0x60,0x60,0x60,0x60,0x60, # A
0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60, # B
0x60,0x10,0x60,0x13,0x5B,0x0E,0x1C,0x09,0x60,0x1F,0x18,0x60,0x07,0x60,0x1A,0x60, # C
0x16,0x5D,0x60,0x19,0x60,0x12,0x5C,0x60,0x0B,0x15,0x60,0x60,0x5E,0x60,0x60,0x1E, # D
0x7F,0x60,0x60,0x60,0x7B,0x0F,0x1D,0x60,0x04,0x05,0x60,0x60,0x07,0x60,0x1A,0x60, # E
0x60,0x7D,0x08,0x60,0x60,0x60,0x7C,0x60,0x0C,0x06,0x60,0x60,0x7E,0x14,0x60,0x17, # F
[1252-GSM_EXT]
# MT message translation:
# ANSI character set to Mobile character extended characters translation
# this table is used when the MT table contains escape character 0x1B
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x0A,0x00,0x00,0x00, # 0
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x1B,0x00,0x00,0x00, # 1
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 2
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 3
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 4
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,'<','/','>',0x14,0x00, # 5
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 6
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,'(' ,0x40,')','=' ,0x00, # 7
```

```
'e' ,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 8
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 9
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # A
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # B
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # C
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # D
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # E
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # F
[GSM-1252]
# MO message translation:
# Mobile message translation to ANSI character set
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F
0x40,0xA3,0x24,0xA5,0xE8,0xE9,0xF9,0xEC,0xF2,0xC7,0x0A,0xD8,0xF8,0x0D,0xC5,0xE5, # 0
0xC1,0x5F,0xD4,0xC3,0xFD,0xD9,0xD0,0xFF,0xCA,0xD3,0xCE,0x1B,0xC6,0xE6,0xDF,0xC9, # 1
0x20, ' ' ,0x22,0x23,0xA4, '%' , '&' ,0x27, '(' , ')' , '*' , '+' , ',' , '-' , '.' , '/' , # 2
'0' , '1' , '2' , '3' , '4' , '5' , '6' , '7' , '8' , '9' , ':' , ';' , '<' , '=' , '>' , '?' , # 3
0xA1, 'A' , 'B' , 'C' , 'D' , 'E' , 'F' , 'G' , 'H' , 'I' , 'J' , 'K' , 'L' , 'M' , 'N' , 'O' , # 4
'P' , 'Q' , 'R' , 'S' , 'T' , 'U' , 'V' , 'W' , 'X' , 'Y' , 'Z' , 0xC4,0xD6,0xD1,0xDC,0xA7, # 5
0xBF, 'a' , 'b' , 'c' , 'd' , 'e' , 'f' , 'g' , 'h' , 'i' , 'j' , 'k' , 'l' , 'm' , 'n' , 'o' , # 6
'p' , 'q' , 'r' , 's' , 't' , 'u' , 'v' , 'w' , 'x' , 'y' , 'z' , 0xE4,0xF6,0xF1,0xFC,0xE0, # 7
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 8
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 9
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # A
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # B
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # C
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # D
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # E
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # F
[GSM_EXT-1252]
# MO message translation:
# Mobile message extended characters translation to ANSI character set
# this table is used when an escape character 0x1B was found
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x0C,0x00,0x00,0x00,0x00, # 0
0x00,0x00,0x00,0x00,0x00, '^' ,0x00,0x00,0x00,0x00,0x00,0x00,0x1B,0x00,0x00,0x00,0x00, # 1
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, '{' , '}' , ' ' , # 2
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, '[' , '~' , ']' , # 3
'|' ,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 4
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 5
0x00,0x00,0x00,0x00,0x00,0x00,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 6
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 7
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 8
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 9
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # A
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # B
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # C
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # D
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # E
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # F
```

GSM 7-bit Code Page (TC/LINK-MD KCS UCP Only)

For conversion between the PC code page and the GSM code page the SMSC API uses the file SmscApiConversion.txt (as defined in the SMSC API Configuration file) in the link directory.

Four character set conversion tables are defined in the alphabet conversion file. To be able to transmit a message, the Mobile Terminated (MT) character set conversion tables have to be defined. To be able to receive a message, the Mobile Originated (MO) character set conversion tables have to be defined.

In each of the sections in the alphabet conversion file, a character set conversion table is defined. Such a table consists of 16 rows and 16 columns. In this way, totally 256 elements can be specified. Each of these elements has to be separated by a comma and represents a hexadecimal number or a character.

To convert a certain character, the numeric value of a character is determined and is used as an offset in a character set conversion table to determine the corresponding converted value. E.g. to convert the '@' sign on a PC to the mobile's representation, first the value of the '@' sign is determined. Subsequently, this value is used in the MT-PC character set conversion table to retrieve the value of the corresponding element, in this case the 64th element. The value of the 64th element is 0x00 and will be substituted in the string for the '@' sign. If the value in the MT-PC table contains 0x1B (Escape) then the value will be taken from the MT_EXT-PC table. Example is the '€' sign, the ASCII value of the Euro sign is 128 in Windows. The 128th element is 0x1B. Therefore table MT_EXT-PC will be used and the 128th element is 0x65 resulting in the output code of both 0x1B and 0x65 to the message.

For incoming messages the process is the reversed. If the message contains 0x1B then table MO_EXT-PC will be used for the conversion. Example message contains 0x1B,0x65. The 0x1B is found; therefore table MO_EXT will be used. The 101st element in MO_EXT is 0x80. This character will then be written to the incoming message.

The conversion file distributed with TC/LINK-MD has the following content:

```
#
# File:
# pc.dcs
#
# Description:
# Conversion tables for converting PC Characters to GSM Characters
#
# Copyright 1998-2002 (C) CMG Wireless Data Solutions B.V.
#
#####
#
# Windows PC
#
#####
[MT-PC]
# MT message translation:
# ANSI character set to Mobile character set translation
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F #
0xFF,0x01,0x02,0x03,0x06,0x06,0x60,0x60,0x60,0x60,0x0A,0x60,0x1B,0x0D,0x60,0x60, # 0
0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x1B,0x60,0x60,0x60,0x60, # 1
0x20, '!', 0x22,0x23,0x02, '%', '&', 0x27, '(', ')', '*', '+', ',', '-', '.', '/', # 2
'0', 0x31, '2', '3', '4', '5', '6', '7', '8', '9', ':', ';', '<', '=', '>', '?', # 3
0x00, 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', # 4
'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z', 0x1B,0x1B,0x1B,0x1B,0x11, # 5
0x60, 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', # 6
'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z', 0x1B,0x1B,0x1B,0x1B,0x60, # 7
0x1B,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60, # 8
0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60, # 9
0x20,0x40,0x60,0x01,0x24,0x03,0x60,0x5F,0x60,0x60,0x60,0x60,0x60,0x60,0x60, # A
0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x60, # B
0x60,0x10,0x60,0x13,0x5B,0x0E,0x1C,0x09,0x60,0x1F,0x18,0x60,0x07,0x60,0x1A,0x60, # C
0x16,0x5D,0x60,0x19,0x60,0x12,0x5C,0x60,0x0B,0x15,0x60,0x60,0x5E,0x60,0x60,0x1E, # D
0x7F,0x60,0x60,0x60,0x7B,0x0F,0x1D,0x60,0x04,0x05,0x60,0x60,0x07,0x60,0x1A,0x60, # E
0x60,0x7D,0x08,0x60,0x60,0x60,0x7C,0x60,0x0C,0x06,0x60,0x60,0x7E,0x14,0x60,0x17, # F
[This_Entry_is_ignored]
0x00,0x00,0x00,0x00,
[MT_EXT-PC]
# MT message translation:
```

```

# ANSI character set to Mobile character extended characters translation
# this table is used when the MT table contains escape character 0x1B
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x0A,0x00,0x00,0x00, # 0
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x1B,0x00,0x00,0x00,0x00, # 1
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 2
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 3
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 4
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 5
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 6
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 7
'e' ,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 8
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 9
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # A
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # B
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # C
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # D
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # E
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # F
[This_Entry_is_ignored]
0x00,0x00,0x00,0x00,
[MO-PC]
# MO message translation:
# Mobile message translation to ANSI character set
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F
0x40,0xA3,0x24,0xA5,0xE8,0xE9,0xF9,0xEC,0xF2,0xC7,0x0A,0xD8,0xF8,0x0D,0xC5,0xE5, # 0
0xC1,0x5F,0xD4,0xC3,0xFD,0xD9,0xD0,0xFF,0xCA,0xD3,0xCE,0x1B,0xC6,0xE6,0xDF,0xC9, # 1
0x20,0x22,0x23,0xA4,0x27,0x28,0x29,0x2A,0x2B,0x2C,0x2D,0x2E,0x2F,0x30,0x31,0x32,0x33, # 2
'0' ,0x34,0x35,0x36,0x37,0x38,0x39,0x3A,0x3B,0x3C,0x3D,0x3E,0x3F,0x40,0x41,0x42,0x43, # 3
0xA1,0xA2,0xA3,0xA4,0xA5,0xA6,0xA7,0xA8,0xA9,0xAA,0xAB,0xAC,0xAD,0xAE,0xAF,0xB0,0xB1, # 4
'P' ,0xB2,0xB3,0xB4,0xB5,0xB6,0xB7,0xB8,0xB9,0xBA,0xBB,0xBC,0xBD,0xBE,0xBF,0xC0,0xC1, # 5
0xBF,0xC2,0xC3,0xC4,0xC5,0xC6,0xC7,0xC8,0xC9,0xCA,0xCB,0xCC,0xCD,0xCE,0xCF,0xD0,0xD1, # 6
'p' ,0xD2,0xD3,0xD4,0xD5,0xD6,0xD7,0xD8,0xD9,0xDA,0xDB,0xDC,0xDD,0xDE,0xDF,0xE0,0xE1, # 7
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 8
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 9
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # A
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # B
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # C
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # D
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # E
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # F
[This_Entry_is_ignored]
0x00,0x00,0x00,0x00,
[MO_EXT-PC]
# M0 message translation:
# Mobile message extended characters translation to ANSI character set
# this table is used when an escape character 0x1B was found
#
# 0 1 2 3 4 5 6 7 8 9 A B C D E F
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x0C,0x00,0x00,0x00,0x00,0x00, # 0
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x1B,0x00,0x00,0x00,0x00, # 1
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 2
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 3
'|' ,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 4
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 5
0x00,0x00,0x00,0x00,0x00,0x00,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 6
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 7
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 8
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # 9
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # A
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # B
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00, # C

```

```
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, # D  
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, # E  
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, # F
```

Customizing Code Page Tables

In order to support an additional code page or if your SMS-Center operator requires different character coding it will be necessary to customize one of above described code page files.

When doing so, mind the following things:

- Always change the requested character in both tables, that for outgoing and that for incoming SMS.
Background: TC/LINK-WM/MD has to calculate the exact length of an SMS in order to be able to split correctly if the message is too long. So the message is converted to the GSM code page, the calculating and splitting is done, and is converted back to the PC code page before calling the SDK's send function. The SDK requires that the SMS text is handed over in the PC code page, and performs again the conversion to the GSM code page.
- Back up the changed file. When installing a new release of KCS, your version of that file will be overwritten, and you will have to restore it again.

Chapter 8

Setup Checklist

Parameter name	Customer values
KCS CPU number	
Link Server CPU number (optional, used only for link server license)	
Link Server license or TC/LINK-XX license1)	Key: Expire Date: Registrations:
Postscript license1) (optional, KCS CPU number)	Key: Expire Date: Registrations:
PCL5 license key (optional, KCS CPU number)	Key: Expire Date: Registrations:
Kofax Communication Server version	
KCS Server Name	
Link Type to KCS Server and transport type RPC or Native	
Secondary KCS Server Name (for tandem servers only)	
Link Type to secondary KCS Server (for tandem servers only)	
TC/LINK User Name	
TC/LINK User Password	
NT Link User Name (must have write access to at least one directory)	
NT Link User Domain	
NT Link User Password	
Type of TC GSM box (TC/LINK-WM only)	
IP-Address/Name of TC GSM box	
SIM with Number and SIM-PIN for the TC GSM box	
TOPS License(s) (only when using (TC/LINK-MD with TOPS Integration)	
Used SMS-Center Protocol	
Access Agreement with GSM operator (TC/LINK-MD only)	
Maximum message throughput	
IP and Port numbers of SMSC (for in- and outgoing messages)	

Parameter name	Customer values
Short-ID and Password for SMSC	
System Type (SMPP only)	
Bind Mode (SMPP only)	
Default Recipient and Service on KCS for incoming messages without recipient	

1) For Kofax Communication Server < 7.08 in combination with KCS tandem servers these licenses have to be entered for both CPU numbers of the primary and the secondary KCS server.