GPRS Companion Standard

Dutch Smart Meter Requirements

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CONTENTS

List of Definitions

Definition	Description
Attached but no PDP context	The communication unit receives the GSM signal, but there is no TCP/IP connection. The communication unit is in idle state or “off” regarding GPRS.
PDP context	The communication unit is connected on TCP/IP level and is able to exchange information. The communication unit is “on” regarding GPRS
dBm	dBm is an abbreviation for the power ratio in decibel (dB) of the measured power referenced to one milliwatt (mW)
Communication Unit	A Communication Unit can either be an integrated or separate module in the meter. Whenever the term “modem” is used this should be interpreted as being a Communication Unit.

List of abbreviations

Abbreviation	Description
APN	Access Point Name
CENELEC	European Committee for Electro technical Standardization Standards
CS	Central System
DLMS/COSEM	Device Language Message Specification Companion Specification for Energy Metering
GGSN	Gateway GPRS Support Node
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
HSDPA	High Speed Down Link Packet Access
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
LTE	3GPP Long Term Evolution
PDA	Personal Digital Assistance
PDP	Packet Data Protocol
TCP	Transmission Control Protocol
UMTS	Universal Mobile Telephone System
(U)SIM	(Universal) Subscriber Identity Module
WiMAX	Worldwide Interoperability for Microwave Access

1 INTRODUCTION

This document defines the requirements for the GPRS infrastructure as part of the Dutch Smart Meter Specification. In this document all requirements originating from the NTA 8130, or additionally surveyed by a delegation of the Dutch grid operators, are presented in tables. The ultimate goal of this procedure is to reduce ambiguity of the requirements due to a better understanding of the requirements.

1.1 Scope

This document focuses on the P3 interface for Electricity meters since this interface can make use of a GPRS connection. The communication interface P3 (see figure 1.1) is based on the DLMS/COSEM standard. GPRS meters contain 3GPP certified communication modules enabling them to connect to a GSM/GPRS network for data transmission. At a later stage, Grid operators might use alternative technologies for communication, for example UMTS, HSDPA, LTE, Wimax, SMS and/or Mesh.

Whenever the term Communication Unit is used within this document, this applies to the communication unit of the meter.

1.2 Normative references

The following standards are referred to in this companion standard. For undated references the latest edition applies.

Ref No	Document	Description
1.	NTA 8130 NL:2007	*Basisfuncties voor de meetinrichting voor elektriciteit, gas en thermische energie voor kleinverbruikers*
2.	Dutch Smart Meter Requirements v4.0.7 final Main	The main document of the Dutch Smart Meter Requirements, containing all definitions and most of the use cases and requirements
3.	Dutch Smart Meter Requirements v4.0.7 final P1	Companion standard P1
4.	Dutch Smart Meter Requirements v4.0.7 final P2	Companion standard P2
5.	Dutch Smart Meter Requirements v4.0.7 final P3	Companion standard P3
6.	AmvB	Algemene maatregel van Bestuur “Besluit op afstand uitleesbare meet- inrichtingen”

2 GENERAL COMMUNICATION UNIT REQUIREMENTS

2.1 Standards and Frequencies

The communication modules currently used are based on GSM/GPRS

DSMR-G 4.2.1

Description	The offered communication solution must always be compliant to NTA8130 and DSMR Standards.						
Rationale	The suppliers must provide a working mobile communication network for smart metering, supporting the actual versions of the NTA8130 and DSMR.						
Fit criterion	The suppliers must guarantee that the offered communication solution is compliant to NTA8130 and DSMR Standards.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.2.2

Description	The communication unit shall comply with the generic standards for GSM and GPRS.						
Rationale	The GPRS service of the telecommunication unit shall comply with the actual version of the 3GPP TS standard and related documents and with the corresponding frequencies which will be used in the Netherlands at the time of implementation.						
Fit criterion	The communication unit shall comply with the actual version of the 3GPP TS standard and with the corresponding frequencies which will be used in the Netherlands at the time of implementation.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.2.3

Description	The communication unit must be certified on the communication network by the Dutch telecommunication network providers.						
Rationale	The telecommunication network providers must give network approval in the 'Site Acceptance Test' to ensure communication in the mobile network works optimally. The communication provider should have a certification process in place to certify on request a meter/modem.						
Fit criterion	The communication unit shall be certified by the telecom provider selected by the grid operator to comply with the latest version of the 3GPP TS standard and related documents and with the corresponding frequencies which will be used in the Netherlands at the time of implementation.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.2.4

Description	The communication unit must confirm to various international standards regarding the safety requirements for equipment to be connected to telecommunication networks.						
Rationale	This in order to fulfil European guidelines and/or to prevent the grid operator from claims regarding third parties concerning human exposure and radio disturbance.						
Fit criterion	The communication module in the E meter shall fulfil the actual versions of CENELEC/EN EN 41003, CENELEC/EN EN 50360, CENELEC/EN EN 50371, CENELEC/EN EN 50385, and CENELEC/EN EN 50401.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

2.2 Performance & Availability

For a successful roll-out, the number of smart meters that have mobile network coverage needs to be maximized. The communication unit shall provide reliable and robust communication services within the mobile network.

DSMR-G 4.2.5

Description	The E Meter is able to do a GPRS attach with a defined minimum signal strength.						
Rationale	The E Meter is able to do a GPRS attach with a defined minimum signal strength.						
Fit criterion	The receiver sensitivity of the Communication Unit is at least -95 dBm at the RF input of the communication Unit.						
History	04 Apr 2011	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.2.6

Description	The communication unit must provide at least Class 10 GPRS communication.						
Rationale	GPRS Multi slot Classes are product dependent, and determine the maximum achievable data rates in both the uplink and downlink directions. In a Class 10 device 4 Downlink slots and 2 uplink slots are available with a maximum of 5 active slots. The class should match the modem type.						
Fit criterion	The communication unit must provide at least Class 10 GPRS communication.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.2.7

Description	If the communication unit receives a GSM call or SMS messages during a GPRS connection with active PDP context it shall proceed with the GPRS connection.						
Rationale	In a normal network speech has priority over a data connection. In this metering network the data connection shall have priority.						
Fit criterion	If the communication unit receives a GSM voice call during a GPRS connection with active PDP context it shall proceed with the GPRS connection and no actions related to the voice call are executed.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.2.8

Description	The E meter must be able to automatically recover from communication problems, using a randomising algorithm to re-establish the PDP context.						
Rationale	Automatic recovery of the E meter after communication problems is necessary for the availability of communication with the E meter. In order to prevent that many disconnected meters re-establish a GPRS attach and PDP context simultaneously, a randomising reconnect algorithm is to be used.						
Fit criterion	The reconnection behaviour of a communication unit after detecting an unexpected interrupted communication session can be configured.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit E meter

2.3 Roaming

The telecom provider must supply the Grid Operator with an efficient, trustworthy and flexible communication solution. Flexibility in this sense is largely determined by the flexibility to use multiple mobile networks, now and in the future. To maximize coverage smart meters must have access to more than one mobile network. If the primary network fails to deliver the necessary coverage the smart meter should be able to switch to other mobile networks that are available without having to change USIM cards or visit meters in any other way. Nevertheless, it must be possible to prevent the use of other mobile networks in case of bad reception (e.g. switching-off roaming per USIM card).

DSMR-G 4.2.9

Description	For the communication unit national roaming over the GPRS networks of different national telecom providers must be possible. This may require multiple IMSI support in the communication unit .						
Rationale	if the GPRS signal of one telecom provider is too weak for a sufficient GPRS connection, it must be possible to roam to the network of a different telecom provider. This will provide maximum availability of the E meter. This requires multiple IMSI support. USIM cards are identified on their individual operator networks by holding a unique International Mobile Subscriber Identity. Mobile operators connect mobile phone calls and communicate with their market USIM cards using their IMSI.						
Fit criterion	▪ National roaming between GPRS networks of different national telecom providers is supported. ▪ The communication unit shall be able to support SIM cards with multiple IMSis.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

2.4 USIM Requirements

USIM cards are the local interface between the communication module and the mobile communication network and are therefore expected to be a critical component for achieving continuous operation of smart meters. USIM cards must be guaranteed to last at least the lifetime of the smart meters being installed.

DSMR-G 4.2.10

Description	The communication unit supplier shall support USIM and Chip SIMs.						
Rationale	Different kinds of SIM technologies exists. The communication unit provider shall at least support the USIM and Chip SIM.						
Fit criterion	The communication unit supplier shall support USIM and Chip SIMs (VQFN-8)						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.2.11

Description	The communication unit in a E meter shall support IMEI lock of the USIM card						
Rationale	To prevent that a USIM card can be removed and used in an other device it is possible to have an application on the USIM card that checks if the USIM card is still in the same device which is identified by its IMEI number. The communication unit shall support this functionality.						
Fit criterion	The communication unit shall at least apply to de 3GPP standard TS 11.14 Release 1999 (Specification of the SIM Application Toolkit (SAT) for the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface)						
History	Sept. 2010	**Origin**	GPRS	**Port**	P3	**Applicable**	Comm. Unit

2.5 GPRS signal strength and registration indications

During installation it is important to have high success rates regarding installed and connected (registered) E meters. A tool will be provided by the meter itself by means of display indications of the GPRS signal strength and registration status.

DSMR-G 4.2.12

Description	The E meter shall indicate on the display the reception of the GPRS signal in a minimum of 4 separate signal strength levels.
Rationale	During installation it is important to have high success rates regarding installed and connected E meters. A tool will be provided by the meter itself by means of a display indication in 4 separate signal strength levels as any other measurement by e.g. PDA will be different and could lead to inaccessible meters. The signal is sufficient for GPRS if it is -95 dBm at the RF input (indoor) or better.
Fit criterion	The E meter shall present on the display that the signal-level of the GSM/GPRS network is sufficient for a good communication during “attached but no PDP context” in a minimum of 4 separate signal strength levels:

	- No reception RSSI < -100 dBm - Low reception -100 ≤ RSSI < -95 - Medium reception -95 ≤ RSSI < -85 - High reception RSSI ≥ -85 dBm						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit E meter

DSMR-G 4.2.13

Description	The E meter shall provide network information to the CS.						
Rationale	This requirement is necessary for pro-active measurements by the grid operator if problems arise regarding the GPRS connections.						
Fit criterion	The E meter shall provide the network information (signal level/RSSI, Number of base stations, Cell ID) of the GSM/GPRS network to the CS when the use case “Retrieve M&S equipment state” is invoked.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit, E Meter

3 GPRS METER ACCESS AND CONNECTION SET-UP

The meter access and connection set-up process is shown in figure 1. For each step in the communication process different options and the corresponding requirements will be described. The meter access and connection set-up can be visualized in 7 steps:

1. Wake-up meter
2. Authentication
3. Assign IP address
4. Initiate communication
5. Initiate data exchange
6. Data exchange
7. Close connection

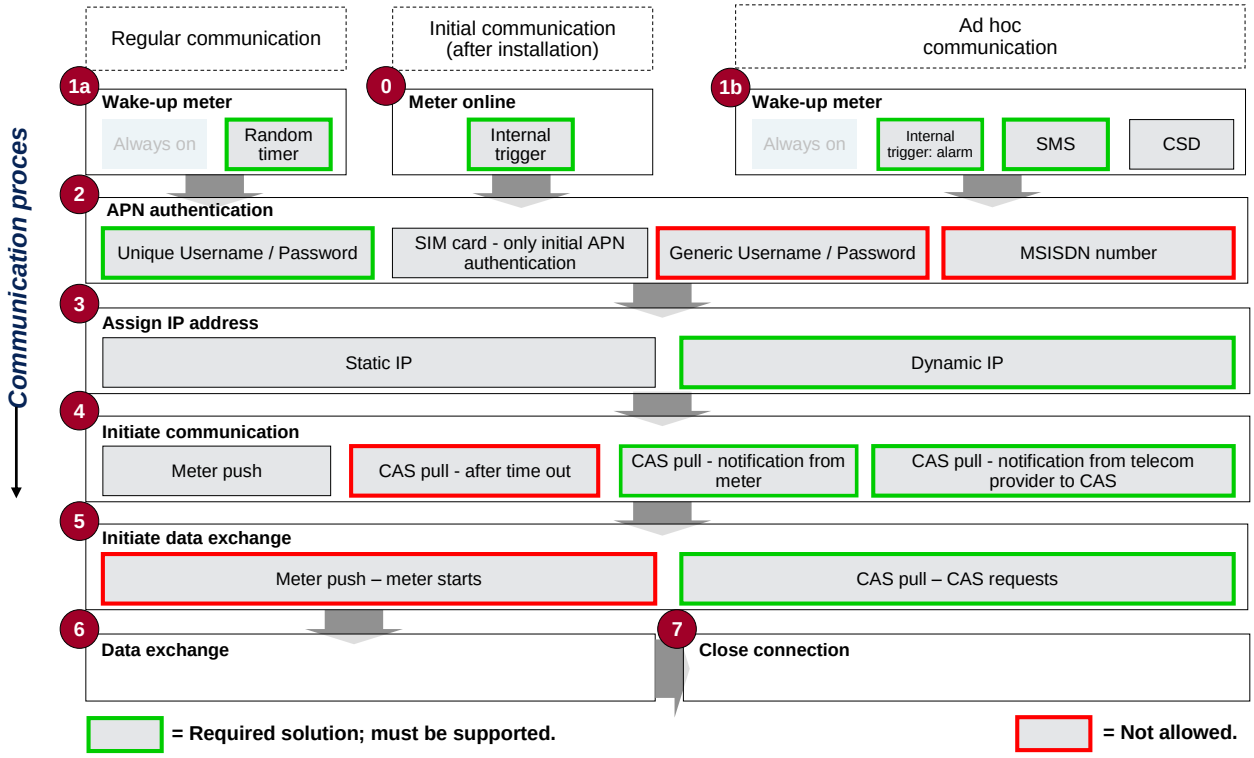

Figure 1: Meter access and connection set-up process

3.1 Wake up meter

The first step in the communication process is to have meters 'online' in the mobile network (PDP context). Meters can be either always online or meters are not continuously online and have to be 'woken up':

- 'Always on' communication: Meter continuously has PDP context in the mobile network. There can be data exchange 'at any time'.
- Internal trigger (no continuous PDP context): Meter must be 'woken up' before data exchange over IP can take place. An internal trigger is generated by the meter itself using

an internal (randomized) clock or by any event for which the meter is configured to wake up. After being woken up meters have PDP context.

- External trigger (no continuous PDP context): Meter must be 'woken up' before data exchange over IP can take place. Triggers are coordinated by the CS. External triggers can be CSD (or voice call if secure), SMS or Network Initiated PDP context. After being woken up meters have PDP context.
  In all wake-up scenario's the meter will wait for TCP establishment from the CS during a configurable time (inactivity_time_out of the TCP-UDP Setup (Class ID 41))

The requirements related to both wake-up processes are described in this section.

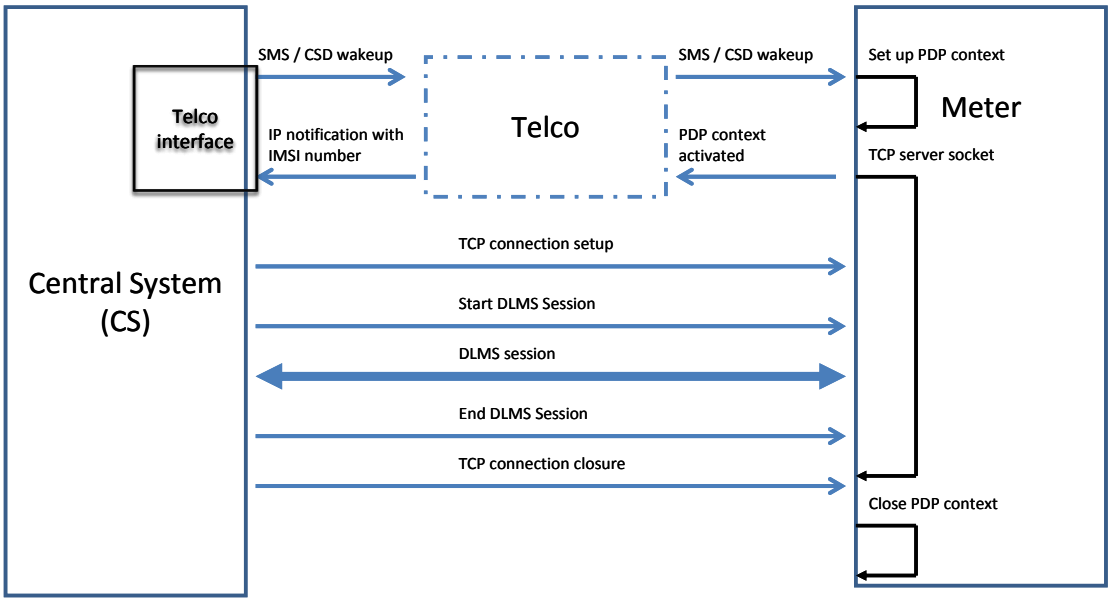

Figure 2 : Wake Up Mechanism 1

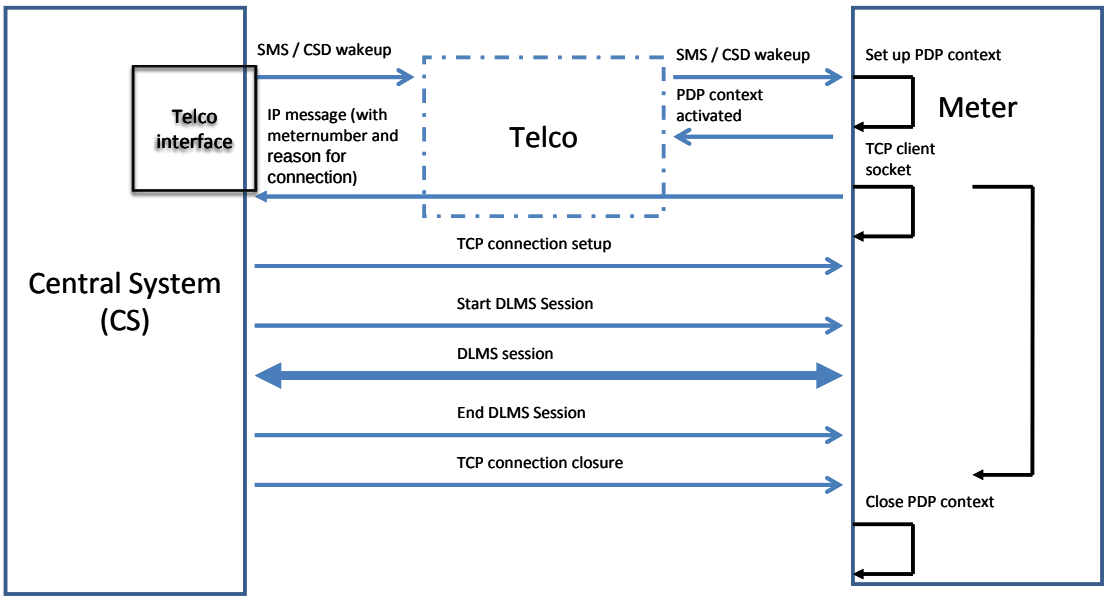

Figure 3: Wake Up Mechanism 2

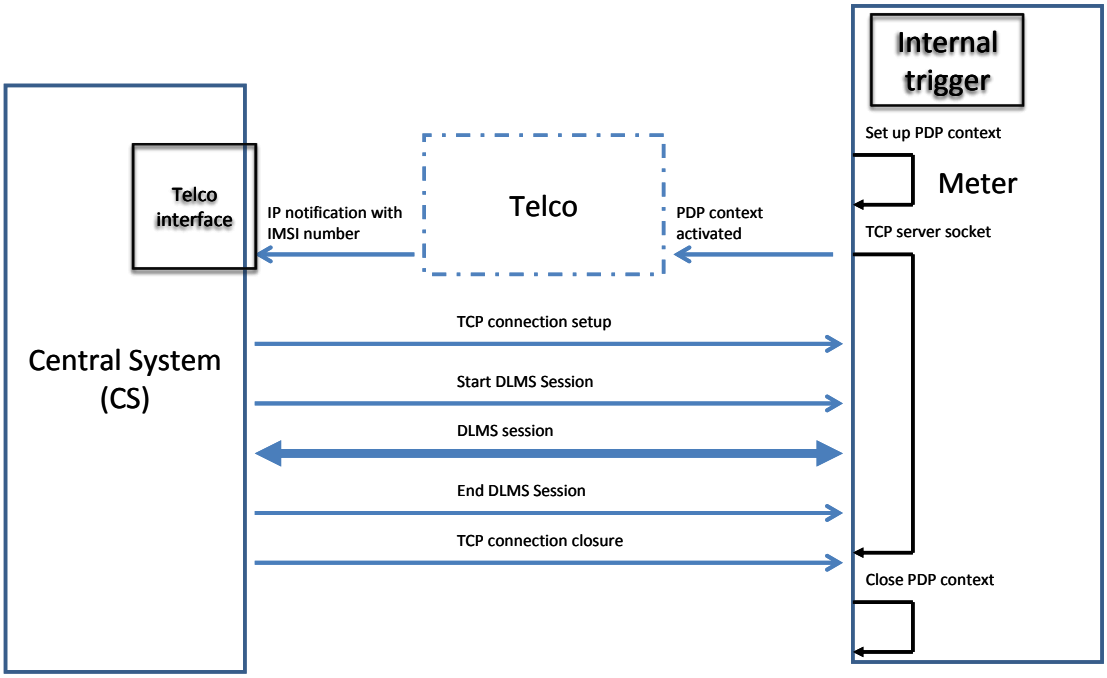

Figure 4: Meter initiated wake-up mechanism 3

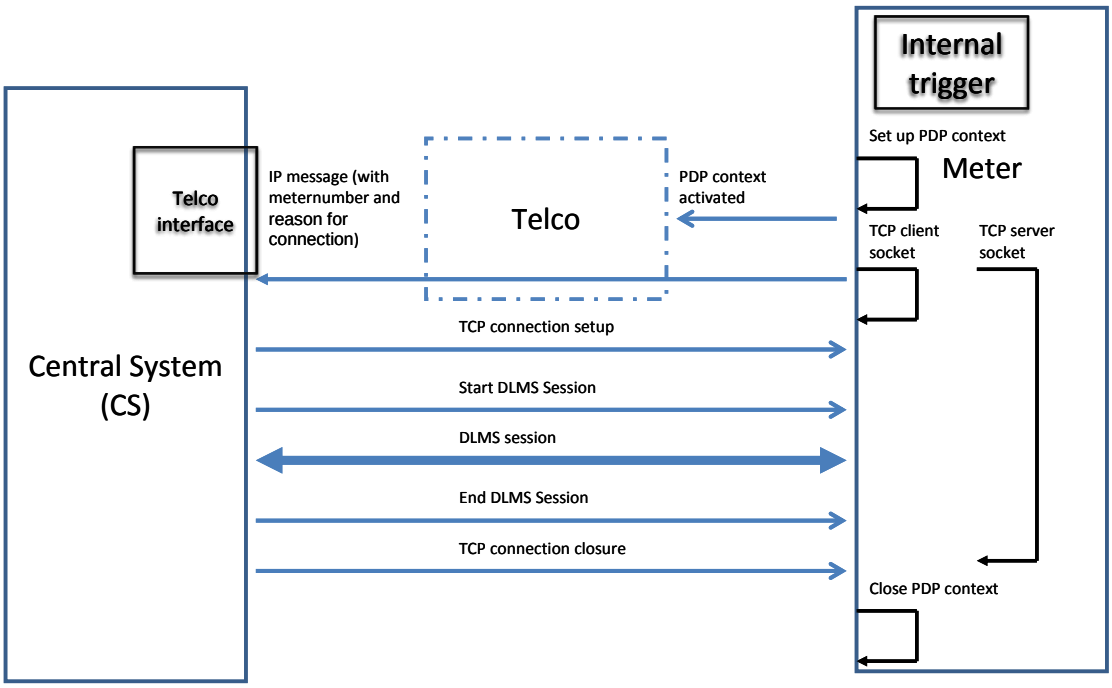

Figure 5: Meter initiated wake-up mechanism 4

Figure 2 and 5 show two TCP sockets.

1. Client socket to send the optional TCP message.
2. Server socket to listen to the incoming DLMS TCP connection.

The Server socket shall be opened at the same time the client socket is opened to prevent missing TCP connections.

Every connection from figure 2 thru 5 has the following steps:

1. Setup of PDP context
2. Setup of TCP server connection and optional:
   2a. Setup of TCP client connection
   2b. Send TCP message
   2c. Closure of the TCP client connection
3. Start DLMS Session
4. DLMS Message exchange
5. End DLMS Session
6. Closure of TCP server connection
7. Closure of PDP context

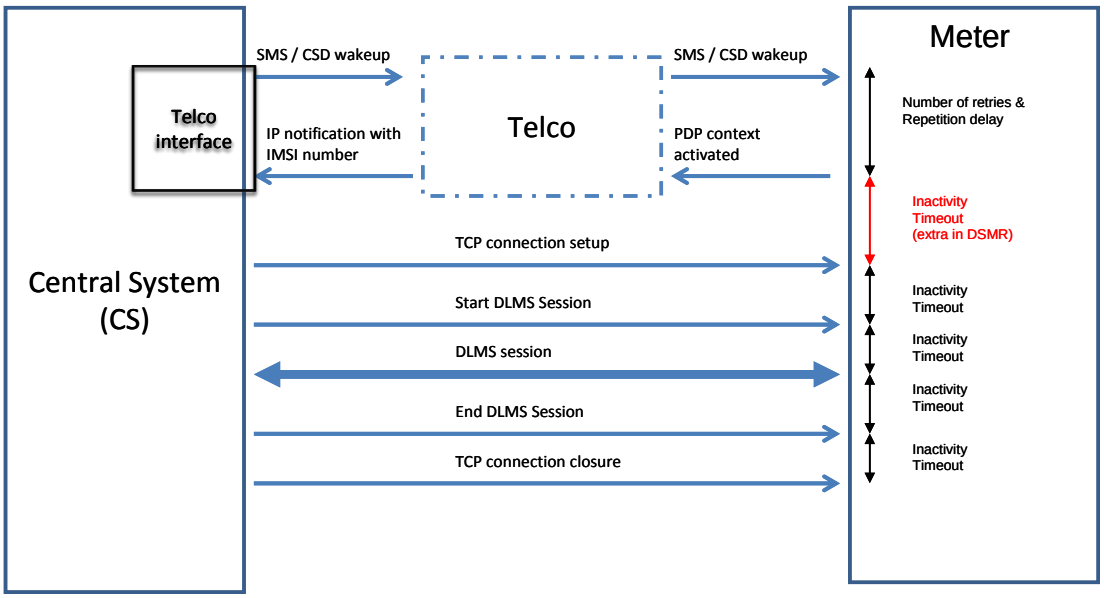

Figure 6: Inactivity time out for Mechanism 1 and 3

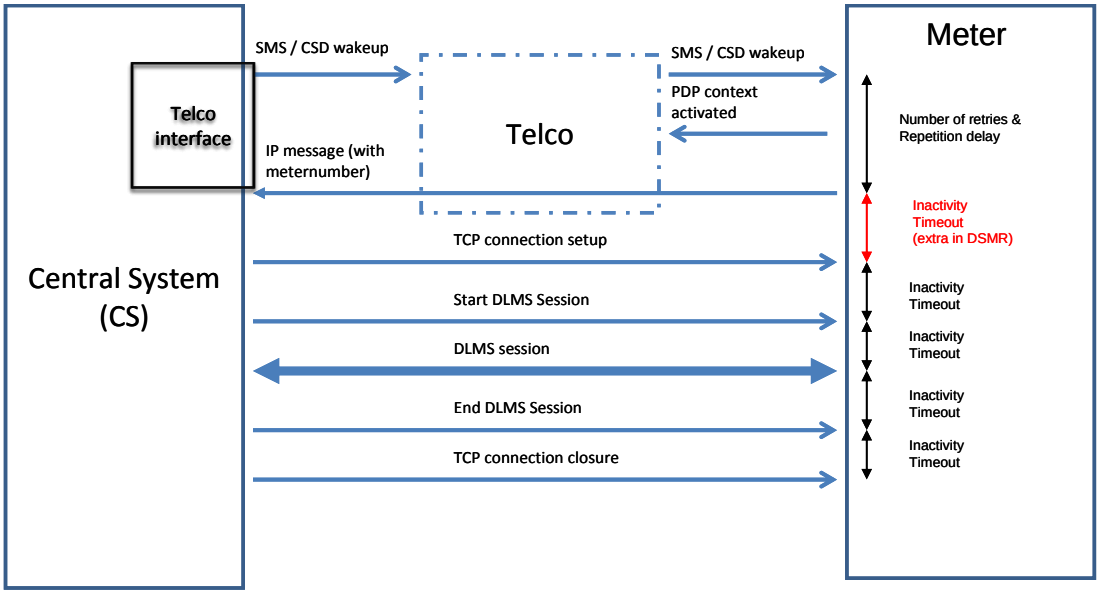

Figure 7: Inactivity time out for Mechanism 2 and 4

The DLMS specifies that the inactivity timeout is used to check whether a frame is received on a TCP connection. In DSMR we also use this time-out to check whether a TCP connection is set up for DLMS communication.

Wake up using internal trigger

DSMR-G 4.3.1

Description	The E meter shall initiate a session to the CS based on an internal trigger, using a configurable time window independent of external triggers.						
Rationale	The use of an internal trigger is necessary to allow the meter to initiate a communication session to the CS.						
Fit criterion	The communication unit shall be trigged randomly by the E meter to set up the connection with the CS of the grid operator within a configurable time frame independent of external triggers. The meter will close the session in case the time exceeds a configured time limit.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit, E Meter

DSMR-G 4.3.2

Description	It is configurable in the E meter which events are treated as alarms and used as an internal trigger for initiating a communication session to the CS.						
Rationale	Some events in the E meter might be considered so important that Grid Operators want to be notified immediately. These events are treated as alarms. The E meter shall initiate a communication session with the CS at the moment one of these alarms appear.						
Fit criterion	It is configurable in the E meter which events are treated as alarms and are used as an internal trigger for initiating a communication session.						
History	Jan 2011	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit, E meter

Wake up using external trigger

DSMR-G 4.3.3

Description	Depending on the configuration of the meter, it shall be possible to receive a wake up text message (SMS) from the CS to the E meter.						
Rationale	This requirement is necessary for on demand or ad-hoc access to the meter. Meters are only connected to the GPRS network when there is a need for data communication. It must be possible to trigger a connection of the meter to the GPRS network. This trigger is known as a wake-up message and will be sent by the CS.						
Fit criterion	It shall be possible for the grid operator to wake up the E meter if it does not have an active GPRS connection. This can be done by sending an SMS wake-up message.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	E meter

DSMR-G 4.3.4

Description	Depending on the configuration of the meter, it shall be possible to wake up the E meter using a CSD call.						
Rationale	This requirement is necessary for on demand or ad-hoc access to the meter. Meters are only connected to the GPRS network when there is a need for data communication. It must be possible to trigger a connection of the meter to the GPRS network. This trigger is known as a CSD wake-up call and will be sent by the CS. For security reasons, the GPRS session will be set up by the E meter.						
Fit criterion	It shall be possible for the grid operator to wake up the E meter if it does not have an active GPRS connection. This can be done by sending a CSD call to the meter. The E meter will not answer the call, but instead will set up a new the GPRS connection and login to the network.						
History	8 Apr 2011	**Origin**	TST	**Port**	P3	**Applicable**	E meter

DSMR-G 4.3.5

Description	For future applications the Communication Unit / E meter should be able to receive Network Initiated GPRS Attach (NIGA) messages.						
Rationale	This requirement is necessary for on demand or ad-hoc access to the meter. Meters are only connected to the GPRS network when there is a need for data communication. It must be possible to trigger a connection of the meter to the GPRS network. This trigger is known as a wake-up call and for future applications the Communication Unit / E meter should be able to receive Network Initiated GPRS Attach (NIGA) messages.						
Fit criterion	For future applications it shall be possible for the grid operator to wake up the E meter if it does not have an active GPRS connection via Network Initiated GPRS Attach (NIGA) messages.						
History	24 Aug 2009	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit E meter

DSMR-G 4.3.6

Description	It shall be configurable that the E meter sends an IP message to a defined fully qualified domain name after the PDP context is established.						
Rationale	When the GPRS communication is meter initiated or network pushed, the Central System may not be aware when the E meter receives a PDP context and that the CS can communicate with the E meter. The meter can inform the the Central System that it has PDP context is activated by sending a IP message to the Central System. Not every Central System uses these messages and there for it shall be possible to switch sending the message after establishing a PDP context on and off.						
Fit criterion	It shall be possible to turn on and off that the Communication Unit after establishing PDP context sends the defined IP message.						
History	Jan 2011	**Origin**	GPRS	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.3.7

Description	The address and the content of an IP message that is send to the Central System can be defined.						
Rationale	When the Central System uses the IP message which is send by the Communication Unit after establishing PDP context to register that communication whit the device is possible, the IP message should be send to the correct address of the Central System and should contain the minimum information needed to communicate with the device. • The correct address is the IP address or domain name and port number of the Central System. • The minimum information is the actual assigned IP address and an identifier of the E meter to identify the device so the Central System can select the correct authentication mechanism and the correct keys when communicating with the device without accessing the public client of the device based on the IP address. The Equipment Identifier will be used for this purpose. The actual assigned IP address can be deducted from the sender from the IP message.						
Fit criterion	• The content of the IP message shall contain the Equipment Identifier. • The fully qualified domain name and port number of the Central System which is used for the IP message send to the Central System after establishing PDP context can be configured in the Communication Unit.						
History	Jan 2011	**Origin**	GPRS	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.3.8

Description	It shall be possible to configure endpoints in the E meter by their IP address and by a Fully Qualified Domain Name.						
Rationale	Endpoints have to be configured in the E meter. Sometimes the IP address of this endpoint changes due to all kind of reasons. When a Domain Name is used in the configuration of the E meter, a change of IP address of the endpoint does not need to be cascaded to every E meter that uses this endpoint but the IP address can be updated in the DNS Server.						
Fit criterion	It must be possible to use IP addresses or fully qualified Domain Names for every endpoint configuration in the E meter. The IP address should match the standards for IP addresses. The Domain Name shall at least support 35 characters length domain names.						
History	Jan 2011	**Origin**	GPRS	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.3.9

Description	The device shall support fully qualified domain names.						
Rationale	Whenever a fully qualified domain name is used to define a destination, the device shall translate this to the correct IP address when sending the IP message.						
Fit criterion	The E meter shall use the DNS protocol to resolve Fully Qualified Domain Names to IP addresses whenever this is necessary.						
History	Jan 2011	**Origin**	GPRS	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.3.10

Description	The DNS server is configured dynamically when retrieving a PDP context						
Rationale	The primary and secondary DNS server which the device shall use will be set in the device each time the devices establishes a PDP context.						
Fit criterion	The devices receive and store the IP addresses of the primary and secondary address when establishing a PDP context based on the DHCP protocol.						
History	Jan 2011	**Origin**	GPRS	**Port**	P3	**Applicable**	Comm. Unit

3.2 Authentication and security

The communication infrastructure that will be implemented in the smart meter landscape must be secure. Unauthorized access to and usage of the communication network and meters must be prevented and customer information must be protected. Exploits that bypass the security measures must be prevented by all means and impact must be minimized. The authentication process is equal for the regular and on demand communication process. The requirements related to the authentication process are described in this section.

DSMR-G 4.3.11

Description	The APN password should be changeable.						
Rationale	During the lifetime of the meter it might be necessary to change the password for security reasons.						
Fit criterion	It shall be possible for the grid operator to change the password that is used as a login credential (APN password).						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit E meter

DSMR-G 4.3.12

Description	Only the necessary set-up information is allowed to be stored on the USIM cards or Chip/Soft SIM cards. The necessary set-up information is network and modem dependent.						
Rationale	In order to provide additional security the information necessary for network access is not saved on the USIM cards or Chip/Soft SIM cards. Only the necessary set-up information is allowed to be stored on the USIM cards or Chip/Soft SIM cards. Necessary set-up information is network and modem dependent.						
Fit criterion	The network access information shall not be saved on the USIM cards or Chip/Soft SIM cards.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	Comm. Unit

DSMR-G 4.3.13

Description	The meter must have enough capacity to handle a sufficiently large number of phone numbers in the so called “PSTN Auto Dial Phone List”. See Blue Book 10th edition.						
Rationale	During the life time of the meter it can happen that several modem pools are used for calling the meters. These modem pools can use different phone numbers. In case of a hardware switch from one modem supplier to another modem supplier (IT infra structure of a grid company) it must be possible to enter enough telephone numbers in the white list.						
Fit criterion	It must be possible to enter 32 phone numbers in the white list of each meter.						
History	17 Jun 2010	**Origin**	TST	**Port**	P3	**Applicable**	E meter

DSMR-G 4.3.14

Description	The communication unit shall provide for a number of GPRS communication settings to be remotely changeable.						
Rationale	The communication unit shall provide for the possibility to remotely change a number of communication settings: ▪ Whitelist for wake-up calls ▪ APN name (The APN name is the access address to the GPRS service network. ▪ Password (PAP) ▪ Number of retries to establish an (initial) PDP context ▪ Time between retries ▪ Inactivity time-out ▪ GPRS connection mode (always-on or wake-up)						
Fit criterion	The communication unit shall provide for a number of communication settings to be remotely changeable: the Whitelist for wake-up calls, APN name, Password, Number of retries to establish an (initial) PDP context, time between retries, Inactivity time-out, and GPRS connection.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3, P3.2	**Applicable**	Comm. Unit

3.3 Assign IP address

The communication unit shall support dynamic IP address assignment. After the connection request has been accepted the result is reported to the meter. The meter now has an authorized IP address. The requirements related to the assignment of IP addresses are described in this section.

DSMR-G 4.3.15

Description	The communication unit shall support dynamic IP address assignment.						
Rationale	IP addresses are provided by the central system. This can be either static or dynamic addresses.						
Fit criterion	The communication unit shall support dynamic IP address assignment.						
History	18 Nov 2008	**Origin**	TST	**Port**	P3	**Applicable**	COMM. UNIT

3.4 Initiate communication

The next step is to initiate the communication. Communication can be initiated by the meter or the Central System. The requirements related to the initiation of the communication process are described in the Dutch Smart Meter Requirements P3 Companion standard, section 9.

3.5 Initiate data exchange

The procedures to initiate the data exchange are described in the Dutch Smart Meter Requirements P3 Companion standard, section 9.

3.6 Data exchange

The procedures for the actual data Exchange are described in the Dutch Smart Meter Requirements P3 Companion standard.

3.7 Close connection

At the end of the data exchange the GPRS connection can be closed again until the next regular or on demand data exchange, according to the Dutch Smart Meter Requirements P3 Companion standard, section 9..