

gMUC-Controller

XML Interface for Local and WAN Communication

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Change History

Version	Date	Who	Chapter	Changes compared to previous version
0.1	30.04.2010	HKE	Alle	initial
0.2	04.05.2010	HKE		xml setconfig
0.3	12.05.2010	GEX		xml setconfig extension for meters, xml getconfig
0.4	09.03.2011	HKE		revised
0.5	22.08.2011	HKE	4	Push
0.6	24.10.2011	HKE	2.5.1	info request
0.7	02.12.2011	GEX	2.6, 2.7	Getconfig/setconfig (PushTarget, ObisMapEntry) WAN/LAN configuration Relay support
0.8	14.11.2012	GEX	2.5 2.6	Relay Status in info add example configuration of interfaces MBUS, RS232
0.9	25.04.2013	HKE	2.6 2.7	setconfig / getconfig -MeterTemplate -WEB UI access -WEB data access

1 INTRODUCTION

The gMUC controller records metering data for electricity, gas, water and heat consumption, and stores it temporarily, as defined by the "data logger". A "metering client" requests data via the WAN interface and http(s) transport protocol. Metering data are delivered as http message content in XML data format.

2 XML DATA STRUCTURES

A request is started by a specific http(s) command. The body of the http(s) response contains an XML data structure. All responses are embedded into the following XML body:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns="urn:dnt-meter:temp-1-0">
    ... XML data ...
</Envelope>
```

The XML interface is structured into the following functional groups:

Name	Explanation
info	Requests for current status of device, meter, interface
current	Requests for current metering values
stored	Requests for stored metering values
setconfig	Configuration settings for device, meter, interface
getconfig	Requests for configuration setting of device, meter, interface

2.1 General XML Nodes

Name	Explanation
utime	Absolute time in seconds since 1970 (UNIX time)
iso8601	Readable time (date, time) according to ISO8601
source	Source of time (RTC, network time, meter, unknown)
osc	Operating seconds counter

2.2 General XML Attributes

Name	Explanation
deviceID	Unique ID of gMUC
firmware	Firmware identification
enable	Component (interface, meter) active / inactive
name	Interface name
address	Physical meter address
mfct	Meter manufacturer ID (3 ASCII characters)
medium	Meter medium ID (E,G,A,H,C,W,w,O,U,Z,Y,K,V,c,h,X)
profile	Meter Logger profile

2.3 current

Via *current*, a metering client can read current consumption values.

2.3.1 http Request

<http://192.168.168.10/current?METER-ADDR=10310037&MODE=Last&MEDIUM=E&MFCT=ESY>

<http://192.168.168.10/current?METER-ADDR=37884655&MODE=Last,OBISID=1:0.1.8.0.1:0.9.1.0&MEDIUM=E&MFCT=ESY>

Parameter:

Name	Value	Explanation
METER-ADDR	"xxxx"	Meter address(es)
MFCT	"xxxx"	Filter: manufacturer code
MEDIUM	E,G,V,K,WO,Z,U,Y,A,X	Filter: medium
MODE	"Last" "Force"	Last received meter value Forced meter reading
[OBISID]	"xxxx"	Filter: OBIS code (comma separated)
[RAW]	"base64"	Output of RAW data in base64 format

2.3.2 http/xml Response

```
<Current deviceID="000022334400" name="gMUC" firmware="DNT8190-gMUC-3.00-512">
  <RequestTime utime="1272619777" iso8601="2010-04-30T09:29:37Z" osc="1613832" source="Network Time" />
  <Meter address="02117800" mfct="EMH" medium="E" id="02117800" activate="true">
    <Datapoint profile="1m">
      <Entry name="EnergyA+T1" id="1-0:1.8.1">
        <DateTime utime="1272619759" iso8601="2010-04-30T09:29:19Z" source="Network Time" />
        <Value unit="Wh">45432.5</Value>
      </Entry>
      <Entry name="EnergyA+T2" id="1-0:1.8.2">
        <DateTime utime="1272619759" iso8601="2010-04-30T09:29:19Z" source="Network Time" />
        <Value unit="Wh">1280.7</Value>
      </Entry>
      <Entry name="Power" id="1-0:1.7.0">
        <DateTime utime="1272619759" iso8601="2010-04-30T09:29:19Z" source="Network Time" />
        <Value unit="W">65.0</Value>
      </Entry>
    </Datapoint>
  </Meter>
</Current>
```

With RAW Output

```
<Current deviceID="000022334400" name="gMUC" firmware="DNT8190-gMUC-3.00-512">  
  <RequestTime utime="1272619361" iso8601="2010-04-30T09:22:41Z" osc="1613416" source="Network Time" />  
  
  <Meter address="03168054" mfct="ABB" medium="E" id="03168054" activate="true">  
    <Datapoint profile="1m">  
      <Raw  
        encoding="base64">MC4wLjAoMDMxNjgwNTQpDQowLjkuMSgxMTE5NDEpDQowLjkuMigxMDA0M  
        zApDQoxLjcuMCGwLjAwMCprVykcjEuOC4wKDAwMDAwMC4wMCprV2gpDQoxLjguMSgwMDAw  
        MDAuMDAqa1doKQ0KMS44LjIoMDAwMDAwLjAwKmtXaCkNCjAuMi4wKDNEMDMpDQohDQoD  
      </Raw>  
    </Datapoint>  
  </Meter>  
</Current>
```

2.4 stored

Via *stored*, stored meter values can be read.

2.4.1 http Request

<http://192.168.168.10/stored?METER-ADDR=37884655&MEDIUM=E&MFCT=ESY>

<http://192.168.168.10/stored?METER-ADDR=37884655?FROM=1234567?TO=874569?PROFILE=15m&MEDIUM=E&MFCT=ESY>

Parameter:

Name	Value	Explanation
METER-ADDR	"xxxx"	Meter address
MFCT	"xxxx"	Filter: manufacturer code
MEDIUM	E,G,V,K,WO,Z	Filter: medium
[PROFILE]	15m, 1h, 1d	Profile name of data logger
[OBISID]	"xxxx"	Filter: OBIS code (comma separated)
[FROM]	"####"	Filter: Timestamp from
[TO]	"####"	Filter: Timestamp to
[RAW]	"base64"	Output of RAW data in base64 format
[LIMIT]	"####"	Number of data points (max)

2.4.2 http/xml Response

```
<Stored deviceID="102030405067" name="gMUC" firmware="DNT8190-gMUC-3.00-512" profile="1m">
  <RequestTime utime="1271150187" iso8601="2010-04-13T09:18:07Z" osc="45989" source="RTC"/>
  <Meter id="37884665" address="37884665" mfct="HYD" medium="w">
    <Datapoint profile="1m">
      <StoreTime utime="1299670440" iso8601="2011-03-09T11:34:00Z" osc="14918916"
        source="Network Time" />
      <DateTime utime="1271150187" iso8601="2010-04-13T09:18:07Z"
        osc="45989" source="RTC"/>
      <Entry name="WaterVolume" id="8-0:1.0.0">
        <Value unit="m3">240.000</Value>
      </Entry>
    </Datapoint>
    <Datapoint profile="1m">
      <DateTime utime="1271150187" iso8601="2010-04-13T09:18:07Z"
        source="RTC"/>
      <Entry name="WaterVolume" id="8-0:1.0.0">
        <Value unit="m3">240.000</Value>
      </Entry>
      <Entry name="WaterVolume2" id="8-0:1.0.1">
        <Value unit="m3">241.000</Value>
      </Entry>
    </Datapoint>
  </Meter>
</Stored>
```


2.5 info

Via *info*, status information about the controller and the meter can be read.

2.5.1 Request

<http://192.168.168.10/info>
<http://192.168.168.10/info?DEVICE=status>
<http://192.168.168.10/info?METER-ADDR=12345678&MFCT=DNT&MEDIUM=E>
<http://192.168.168.10/info?INTERFACE-NAME=RS485>

Parameter:

Name	Value	Explanation
		Output of all meters and interfaces
[DEVICE]	status	General gMUC status information
[METER-ADDR]	"xxxx"	Meter address
MFCT	"xxxx"	Meter manufacturer code
MEDIUM	E,G,V,K,WO,Z, ...	Meter medium
[INTERFACE-NAME]	all LAN WAN WMBUS GPRS RS485	Interface name, or all interfaces

2.5.2 Response

Request for device information:

```
<Info deviceID="000022334400" name="gMUC" firmware="DNT8190-gMUC-3.00-512">  
  <RequestTime utime="1272449853" iso8601="2010-04-28T10:17:33Z" osc="1406726" source="Network Time" />  
  <Device id="000022334400">  
    <Hardware>GPRS/RS485/ETH-0/ETH-1/WMBUS</Hardware>  
    <Firmware>DNT8190-gMUC-0.90-DEBUG.103</Firmware>  
    <LastRebootReason>Application</LastRebootReason>  
    <Relay>OPEN</Relay>  
  </Device>  
</Info>
```

Request for meter information:

```
<Info deviceID="000022334400" name="gMUC" firmware="DNT8190-gMUC-3.00-512">  
  <RequestTime utime="1272450105" iso8601="2010-04-28T10:21:45Z" osc="1406978" source="Network Time" />  
  <Meter address="14677811" mfct="KAM" medium="E" id="14677811" activate="true">  
    <LastReplyReceived>2010-04-28T10:16:53Z</LastReplyReceived>  
    <Interface>WMBUS</Interface>  
    <InterfaceProtocoll>MBUS</InterfaceProtocoll>  
    <InterfaceOptions>ADDR=14677811</InterfaceOptions>  
    <Status>ok</Status>  
    <RSSI>-79dBm</RSSI>  
    <Datapoint>  
      <Entry name="EnergyA+" id="1-0:1.8.0">  
        <DateTime utime="1272449813" iso8601="2010-04-28T10:16:53Z" source="Network Time" />  
        <Value unit="Wh">5100</Value>  
      </Entry>  
    </Datapoint>  
  </Meter>  
</Info>
```

Request for interface information:

```
<Info deviceID="000022334400" firmware="DNT8190-gMUC-0.90-DEBUG.103">  
  <RequestTime utime="1272454122" iso8601="2010-04-28T11:28:42Z" osc="1410995" source="Network Time" />  
  
  <Interface name="GPRS" enable="false">  
    <Apn>internet.t-mobile.de</Apn>  
  </Interface>  
  
  <Interface name="LAN" enable="true">  
    <Address>192.168.168.10</Address>  
    <Mac>00.60.4C.C7.12.81</Mac>  
    <Netmask>255.255.255.0</Netmask>  
  </Interface>  
  
  <Interface name="RS485" enable="true">  
    <Baudrate>300</Baudrate>  
    <LearnMode>OFF</LearnMode>  
    <Options>7N1</Options>  
    <Query>60</Query>  
  </Interface>  
  
  <Interface name="WAN" enable="true">  
    <ConnectedSince>2010-04-28T10:13:36Z</ConnectedSince>  
    <Address>78.54.33.89</Address>  
    <Mac>10.20.30.C0.FF.EE</Mac>  
    <Mode>DYNDNS,PPPoE</Mode>  
  </Interface>  
  
  <Interface name="WMBUS" enable="true">  
    <LearnMode>ON</LearnMode>  
    <Mode>T</Mode>  
  </Interface>  
  
</Info>
```

2.6 setconfig

Via *setconfig*, the system, its interfaces, its devices and its meters can be configured.

2.6.1 Request

<http://192.168.168.10/setconfig.xml>

The request transmits an XML file which contains configuration information. All requests are embedded into the following XML body:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns="urn:doc-dnt-meter-net:temp-1-0">
  <SetConfig deviceID="102030405067">
    ... XML data ...
  </SetConfig>
</Envelope>
```

2.6.1.1 System

The *setconfig / system* request sets system parameters.

Name	Value	Explanation
DateTime	iso8601	Setting the time
DeviceID		gMUC identifier
WEBUIaccess	User / Password	set the WEB UI authentication
DATAaccess	User / Password	set the WEB data authentication

```
<System>
  <DateTime format="iso8601">2010-04-13T09:18:07Z</DateTime>
  <DeviceID>000022334400</DeviceID>
</System>
```

```
<System>
  <WEBUIaccess>
    <User>admin</User>
    <Password>admin</ Password >
  </WEBUIaccess>
</System>
```

```
<System>
  <DATAaccess>
    <User>admin</User>
    <Password>admin</ Password >
  </DATAaccess>
</System>
```

2.6.1.2 Interfaces

The *setconfig / interface* request sets interface parameters.

Name	Value	Explanation
Interface		Interface configuration parameters

```
<Interface name="RS232" enable="true">
  <Baudrate>9600</Baudrate>
  <Options>7N1</Options>
  <Learn>SML</Learn>
</Interface>

<Interface name="RS485" enable="true">
  <Baudrate>9600</Baudrate>
  <Options>7N1</Options>
  <Query>60</Query>
  <Learn>1107</Learn>
</Interface>

<Interface name="WMBUS" enable="true">
  <Mode>S</Mode>
  <Learn>ON</Learn>
</Interface>

<Interface name="MBUS" enable="true">
  <Baudrate>9600</Baudrate>
  <Responses>1</Responses>
  <Options>01</Options>
</Interface>

<Interface name="LAN" enable="true">
  <Address>192.168.168.10</Address>
  <Netmask>255.255.0.0</Netmask>
</Interface>

<Interface name="WAN" delay="5" enable="false">
  <IP4 enable="true">
    <Address>192.168.168.10</Address>
    <Netmask>255.255.0.0</Netmask>
    <Gateway>192.168.168.1</Gateway>
  </IP4>

  <PPPoE enable="false">
    <User>test</User>
    <Password>u1234</Password>
  </PPPoE>

  <DHCP enable="false" />

  <GSM enable="false">
    <Pin>0000</Pin>
    <Apn>internet.t-d1.de</Apn>
    <User>alf</User>
    <Password>melmack</Password>
  </GSM>

  <DNS enable="false">
    <Server>dns.org</Server>
  </DNS>

  <DynDNS enable="true">
    <Server>www.dyndns.org</Server>
    <User>test</User>
    <Password>test1234</Password>
  </DynDNS>
</Interface>
```

```
</DynDNS>

<STUN enable="false">
  <Server>stun01.sipphone.com</Server>
  <Port>3478</Port>
</STUN>

<Ping enable="false">
  <Server1>8.8.8.8</Server1>
  <Server2></Server2>
  <Server3></Server3>
  <Interval>60</ Interval>
  <Length>0</ Length>
  <Repeat>3</ Repeat>
  <Timeout>100</ Timeout >
</Ping>

<NTP enable="false">
  < Server> 0.de.pool.ntp.org</ Server>
  <Interval >3600</ Interval >
</NTP>

</Interface>
```

2.6.1.3 Meter

The *setconfig / meter* request adds, modifies or deletes meters.

Name	Value	Explanation
<Meter>		Starts configuration
address		Technical meter address
medium		Medium
mfct		Manufacturer (always three characters)
id		User defined meter identification
delete	true false	Display delete
<InterfaceName>	WMBUS RS485	Selected interface
<InterfaceProtocol>	1107 MBUS SML MODBUS	Selected protocol
<InterfaceOptions>	Query=<sec> Baudrate=<value>	Interface configuration for given meter (parameter=value)
<PushEnabled>	true false	activate/deactivate push for the meter
<StoreRawEnabled>	true false	Store raw meter data enable/disable
<Key>		AES key
<Profile>		Profile configuration with OBIS codes in comma separated list
name		Unique profile name
max		Max. number of recorded values
event	MINUTE 15MINUTE HOUR DAY WHEEK YEAR	Time intervals for recording values
activation	true false	Activate / deactivate profile for recording values
push-enabled	true false	
push-period	MINUTE 15MINUTE HOUR DAY WEEK	
push-raw-enabled	true false	transmit meter raw data
push-random-offset		random time offset in minutes for start the push data
push-target		name of the PUSH target
delete	true false	delete the profile

Creation of meter with two load profiles (minutes and hours)

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">
  <SetConfig deviceID="22222C0FFEE">
    <Meter meter-id="Meter1234" address="1234" medium="E" mfct=" DNT" id="Meter1234" delete="false">
      <InterfaceName>WMBUS</InterfaceName>

      <InterfaceProtocol>MBUS</InterfaceProtocol>

      <InterfaceOptions></InterfaceOptions>

      <PushEnabled>false</PushEnabled>

      <StoreRawEnabled>true</ StoreRawEnabled >

      <Key>33.B0.55.11.91.F5.22.66.EF.90.AB.89.67.45.78.01 </Key>

      <Profile name="15m" activate="true" max="100" event="15MINUTE"
```

```
push-enabled="false" push-period="MINUTE" push-raw-enabled="true"
push-target="LocalPC">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0
push- random -offset="30"</Profile>

<Profile name="1d" activate="true" max="90" event="DAY"
push-enabled="false" push-period="" push-raw-enabled="false"
push-target="">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0
push- random -offset="30"</Profile>

<Profile name="1h" activate="true" max="90" event="HOUR"
push-enabled="false" push-period="" push-raw-enabled="false"
push-target="">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0
push- random -offset="30"</Profile>

<Profile name="1m" activate="true" max="200" event="MINUTE"
push-enabled="false" push-period="" push-raw-enabled="false"
push-target="">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0
push- random -offset="30"</Profile>

<Profile name="1mon" activate="true" max="15" event="MONTH"
push-enabled="false" push-period="" push-raw-enabled="false"
push-target="">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0
push- random -offset="30"</Profile>
</Meter>
</SetConfig>
</Envelope>
```

Meter deletion

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">
  <SetConfig deviceID="222222C0FFEE">
    <Meter address="1234" medium="E" mfct="DNT" id="Meter1234" delete="true">
      </Meter>
    </SetConfig>
  </Envelope>
```

The "hour" profile is deactivated, no values are recorded for this profile.

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">
  <SetConfig deviceID="222222C0FFEE">
    <Meter address="1234" medium="E" mfct="GEX" id=" Meter1234" delete="false">
      <Interface>WMBUS</Interface>
      <InterfaceProtocoll>MBUS</InterfaceProtocoll>
      <InterfaceOptions></InterfaceOptions>
      <Key>33.B0.55.11.91.F5.22.66.EF.90.AB.89.67.45.78.01</Key>
      <Profile name="Stunde" max="24" event="HOUR" delete="false"
push- random -offset="0" activate="false">1-0:1.8.0</Profile>
    </Meter>
  </SetConfig>
</Envelope>
```

2.6.1.4 Push-Targets

With *setconfig / PushTarget* Request the PushTargets will be added, delete or edit

IMPORTANT!! The unique identification via the attribute *name*.

Name	Wert	Bedeutung
<PushTarget>		
<i>name</i>		unique identification of the Push-Targets
<i>enable</i>	true false	Push Target active/deactiv
<i>host</i>		destination host IP-addr or name
<i>protocol</i>	ftp http	Push protocol
<i>username</i>		User name
<i>password</i>		User password
<i>collect</i>		Collection of Datapoints in one push package
<i>max-run-time</i>		Timeout of the Push request
<i>uri</i>		Filepath (FTP), URI (HTTP)
<i>delete</i>	true false	If true, the entry will be deleted

Set and add of a PushTarget

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">
  <SetConfig deviceID="222222C0FFEE">
    <PushTarget name="LocalPC" enable="true" host="192.168.168.2"
      protocol="http" username="user" password="1user23" collect="10" max-run-time="120"
      uri="/save?GMUC-ID=&lt;GMUC-ID&gt;&amp;METER-ADDR=&lt;METER-ADDR&gt;" />
    </SetConfig>
  </Envelope>
```

Delete a PushTarget

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">
  <SetConfig deviceID="222222C0FFEE">
    <PushTarget name="LocalPC" delete="true" />
  </SetConfig>
</Envelope>
```

2.6.1.5 Meter-Template

With *setconfig / MeterTemplate* Request the MeterTemplate will be added, delete or edit

IMPORTANT!! The unique identification via the attribute *name*.

Name	Wert	Bedeutung
<MeterTemplate>		
<i>name</i>		unique identification of the Push-Targets
<i>enable</i>	true false	MeterTemplate active/deactiv
<i>delete</i>	true false	If true, the entry will be deleted
<i>Meter</i>	<Node>	Meter parameters (2.6.1.3)

PushTarget	<Node>	PushTarget parameters
------------	--------	-----------------------

Set and add a MeterTemplate

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">
  <SetConfig deviceID="7C034CDD6786">
    <MeterTemplate name="DNT" enable="true">
      <Meter vendor="DNT" mfct="DNT">
        <PushEnabled>true</PushEnabled>
        <StoreRawEnabled>true</StoreRawEnabled>
        <Key>12345678969552269585155589899996</Key>
        <Profile name="15m" activate="true" max="1500" event="15MINUTE"
          push-enabled="true" push-period="15MINUTE" push-raw-enabled="true"
          push-target="DNT" push-random-offset="0">1-0:8.1.0</Profile>
      </Meter>
      <PushTarget name="DNT" enabled="true" host="dnt.de" protocol="http" username="user"
        password="pass" collect="20" max-run-time="120" uri="dnt/?muc=<GMUC-ID>" />
    </MeterTemplate>
  </SetConfig>
</Envelope>
```

Delete a MeterTemplate

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">
  <SetConfig deviceID="22222C0FFEE">
    <MeterTemplate name="dnt" delete="true" />
  </SetConfig>
</Envelope>
```

2.6.1.6 ObisMap-Einträge

With *setconfig / ObisMapEntry*-Request the entries of the ObisMap can be added, deleted or edited

Name	Wert	Bedeutung
<ObisMapEntry>		
<i>idx</i>		unique index of the entry
<i>obis-id</i>		Obis-Number
<i>name</i>		readable name of the obis number
<i>delete</i>	true false	Delete the entry

Set and Add of an entry

```
<?xml version="1.0" encoding="ISO-8859-1" ?>  
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">  
  <SetConfig deviceID="222222COFFEE">  
    <ObisMapEntry idx="1"  
      name="EnergyA+"  
      obis-id="1-0:1.8.0">protocol=mbus,dif=04,vif=03.3B,unit=Wh,scaler=0</ObisMapEntry>  
    </SetConfig>  
</Envelope>
```

Delete an entry

```
<?xml version="1.0" encoding="ISO-8859-1" ?>  
<Envelope xmlns:temp="urn:dnt-meter:temp-1-0">  
  <SetConfig deviceID="222222COFFEE">  
    <ObisMapEntry idx="1" delete="true"</ObisMapEntry>  
  </SetConfig>  
</Envelope>
```

2.7 getconfig

The *getconfig* request obtains configuration information about the system, interfaces and meters.

2.7.1 Request

<http://192.168.168.10/getconfig>

2.7.2 Response

The body of the http response contains an XML file which corresponds to the setconfig request.

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<Envelope xmlns="urn:dnt-meter:temp-1-0">
  <GetConfig deviceID="22222C0FFEE" name="gMUC" firmware="DNT8190-gMUC-3.00-512">
    <RequestTime utime="1273663603" iso8601="2010-05-12T11:26:43Z" source="RTC" />

    <PushTarget name="LocalPC" enable="false" host="192.168.168.1"
      protocol="ftp" username="gex" password="gex123" collect="10" max-run-time="120"
      uri="/save?GMUC-ID=&GMUC-ID&&METER-ADDR=&METER-ADDR&gt;" />

    <Meter vendor="info" meter-id="02117800" medium="E" mfct="EMH" address="02117800" id="02117800">
      <InterfaceName>WMBUS</InterfaceName>
      <InterfaceProtocol>SML</InterfaceProtocol>
      <InterfaceOptions>Baudrate=9600</InterfaceOptions>
      <PushEnabled>true</PushEnabled>
      <StoreRawEnabled>true</ StoreRawEnabled >
      <Key />

      <Profile name="15m" activate="true" max="100" event="15MINUTE"
        push-enabled="false" push-period="MINUTE" push-raw-enabled="true" push-random-offset="0"
        push-target="LocalPC">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0</Profile>

      <Profile name="1d" activate="true" max="90" event="DAY"
        push-enabled="false" push-period="" push-raw-enabled="false" push- random -offset="0"
        push-target="">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0</Profile>

      <Profile name="1h" activate="true" max="90" event="HOURL"
        push-enabled="false" push-period="" push-raw-enabled="false" push- random -offset="0"
        push-target="">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0</Profile>

      <Profile name="1m" activate="true" max="200" event="MINUTE"
        push-enabled="false" push-period="" push-raw-enabled="false" push- random -offset="30"
        push-target="">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0</Profile>

      <Profile name="1mon" activate="true" max="15" event="MONTH"
        push-enabled="false" push-period="" push-raw-enabled="false" push- random -offset="30"
        push-target="">1-0:1.8.0,1-0:1.8.1,1-0:1.8.2,1-0:15.7.0</Profile>

    </Meter>

    <Interface name="RS485" enable="true">
      <Learn>OFF</Learn>
      <Baudrate>9600</Baudrate>
      <Options>7N1</Options>
      <Query>60</Query>
    </Interface>

    <Interface name="WMBUS" enable="true">
      <Learn>ON</Learn>
    </Interface>
```

```
<Interface name="WAN" enable="true" delay="10">
  <IP4 enable="true">
    <Address>172.24.100.56</Address>
    <Netmask>255.255.0.0</Netmask>
  </IP4>

  <PPPoE enable="false">
    <User>user</User>
    <Password>password</Password>
  </PPPoE>

  <GSM enable="false">
    <Pin>0000</Pin>
    <Apn>internet.t-mobile.de</Apn>
    <User>password</User>
    <Password />
  </GSM>

  <DHCP enable="false" />

  <DNS enable="false">
    <Server />
  </DNS>

  <DynDNS enable="false">
    <User>username</User>
    <Password>password</Password>
    <Request>-u &lt;username&gt;&lt;password&gt; -a &lt;public-ip&gt;
      -h &lt;domain&gt; -S dyndns</Request>
    <Domain>gmuc.dnsalias.org</Domain>
  </DynDNS>

  <STUN enable="false">
    <Server>stunserver.org</Server>
    <Port>3478</Port>
  </STUN>

  <NTP enable="true">
    <Server>3600</Server>
    <Interval>172.24.1.0</Interval>
  </NTP>
</Interface>

<Interface name="LAN" enable="true">
  <Address>192.168.168.10</Address>
  <Netmask>255.255.255.0</Netmask>
</Interface>

<MeterTemplate name="DNT" enable="true">
  <Meter vendor="DNT" mfct="KAM">
    <PushEnabled>true</PushEnabled>
    <StoreRawEnabled>true</StoreRawEnabled>
    <Key>21211225887845512121245545454589</Key>
    <Profile name="15m" activate="true" max="1500" event="15MINUTE" push-enabled="true"
      push-period="15MINUTE" push-raw-enabled="true" push-target="DNT"
      push- random -offset="30" >1-0:1.8.0</Profile>
  </Meter>
  <PushTarget name="DNT" enable="false" host="dnt.se" protocol="http" username="xuser"
    password="xpass" collect="20" max-run-time="120" uri="dnt/?muc=&lt;GMUC-ID&gt;" />
</MeterTemplate>

<ObisMapEntry idx="1"
  name="EnergyA+"
  obis-id="1-0:1.8.0">protocol=mbus,dif=04,vif=03.3B,unit=Wh,scaler=0</ObisMapEntry>
<ObisMapEntry idx="6" name="EnergyA+T1" obis-id="1-0:1.8.1" />

</GetConfig>
</Envelope>
```

2.8 update

The *update* request uploads a new firmware to the gMUC controller and activates it. The firmware is transmitted in the XML content (base64 encoded).

Name	Value	Explanation
activation	true,false	Firmware will be activated automatically after upload

```
<Update activation="false">  
  <Disposition>Firmware</Disposition>  
  <Filename>DNT8190-gMUC-1.00-133.tgz</Filename>  
  <Length>1824691</Length>  
  <Data>...</Data>  
</Update>
```

2.9 control

The *control* request triggers actions.

Name	Value	Explanation
Command	REBOOT ACTIVATE RELAY	Restart gMUC Firmware activation Relay activation
Delay		Delay in seconds
Firmware	„...“	Firmware name
Mode	OPEN CLOSE	Control the on board relay

```
<Control deviceID="000022334400">  
  <Command name="REBOOT">  
    <Delay>10</Delay>  
  </Command>  
</Control>
```

```
<Control deviceID="">  
  <Command name="ACTIVATE">  
    <Firmware>DNT8190-gMUC-1.00-133</Firmware>  
  </Command>  
</Control>
```

```
<Control deviceID="000022334400">  
  <Command name="RELAY">  
    <Mode>CLOSE</Timeout>  
    <Timeout>10</Timeout>  
  </Command>  
</Control>
```

2.10 push

From version V3.00 the gMUC supported the push technology. It implements the FTP and HTTP protocol. Under PUSH refers to the independent, periodic transmission of meter data to a server (FTP, HTTP) through the gMUC. The server must be provided by operators of disposal site. The demo tool *gm.Center* is available that implements an HTTP server for gMUC push data. Configuring the push feature is web based in gMUC, and is in the service manual (*UserManual_gMUC.pdf*) described. Push transferred XML data structures. The meter data of the push messages correspond to the chapter 2.4.2 (http / xml stored response) documented XML structures.

To form the FTP file name or HTTP query parameters following placeholders are available, which are replaced at runtime with the real values:

placeholder	meaning
<MEDIUM>	meter medium (z.B. E,G,V,K,WO,Z...)
<MFCT>	meter manufacturer code (3 character)
<GMUC-ID>	device ID of the gMUC
<GMUC-NAME>	device Name of the gMUC
<METER-ADDR>	physical meter address
<METER-ID>	symbolic name of the meter
<PROFILE>	profile name of the push data (1m, 15min, 1h, 1d, 1mon)
<PUSHTIME>	actual time of the push job (Unix format – seconds since 01.01.1970)
<PUSHTIME-TXT>	actual time of the push job in readable form (YYYY-MM-DD-HH-MM-SS)
<PUSH-ID>	unique identifier of the push jobs

Example, to form a unique FTP file name to store the xml file in the root folder of the FTP server
gMUC/<GMUC-ID>/meters/<METER-ADDR>/<PROFILE>/<PUSHTIME-TXT>_<PUSH-ID>.xml

Example, to form a HTTP Query string
?GMUC-ID=<GMUC-ID>&METER-ADDR=<METER-ADDR>&PROFILE =<PROFILE>&PUSH-ID=<PUSH-ID>

Push data are all included in the XML tag <Push>, which contains the following attributes / node

attribut / node	meaning						
deviceID	unique identifier of the gMUC						
name	symbolic name of the gMUC						
firmware	firmware name						
pushID	unique identifier of the push message						
<PushTime>	Sender time of the push packet						
<WAN>	actual WAN parameters of the gMUC <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>mode</td> <td>operating mode (IP4, DHCP, GPRS, DSL)</td> </tr> <tr> <td>public-ip</td> <td>public IP address</td> </tr> <tr> <td>dnshost</td> <td>gMUC Host name (if DynDNS active)</td> </tr> </table>	mode	operating mode (IP4, DHCP, GPRS, DSL)	public-ip	public IP address	dnshost	gMUC Host name (if DynDNS active)
mode	operating mode (IP4, DHCP, GPRS, DSL)						
public-ip	public IP address						
dnshost	gMUC Host name (if DynDNS active)						
<Meter>	Meter data → chapter 2.4.2						

XML Push example:

```
<Push deviceID="102030405067" name="gMUC" firmware="DNT8190-gMUC-3.00-512" pushID="45989">
  <PushTime utime="1271150187" iso8601="2010-04-13T09:18:07Z" osc="45989" source="RTC"/>

  <WAN mode="DHCP" public-ip="87.188.70.158" dnshost="gmuc.dnsalias.org"/>

  <Meter id="37884665" address="37884665" mfct="HYD" medium="w" activate="true">
    <Datapoint profile="1m">
      <StoreTime utime="1299670440" iso8601="2011-03-09T11:34:00Z" osc="14918916"
        source="Network Time" />
      <DateTime utime="1271150187" iso8601="2010-04-13T09:18:07Z"
        osc="45989" source="RTC"/>

      <Entry name="WaterVolume" id="8-0:1.0.0">
        <DateTime utime="1271150187" iso8601="2010-04-13T09:18:07Z" osc="45989"
          source="RTC"/>
        <Value unit="m3">240.000</Value>
      </Entry>
    </Datapoint>

    <Datapoint>
      .....
    </Datapoint>
  </Meter>
</Push>
```

1 XSD FILE

The complete XML interface is defined in the XSD file *gMUC_XML_ResponseSchema.xsd*.