

# **W-MBus GPRS AMR Gateway**

User Guide version 2.5.2  
Gateway software version V3.0.0



## Information

Document information	
<b>Title</b>	AMR GATEWAY - WMBUS GPRS
<b>Sub title</b>	User guide version V2.5.2
<b>Document type</b>	Implementation

## Products version

This document applies to the following products:

Name	Reference	Designation	Version
AMR GATEWAY	ARF8011BA	WMBUS 868 – GPRS - SELF-POWERED - EXT. ANTENNA	V3.0.0

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## SUPPORT TECHNIQUE

### Site web

Notre site Web contient de nombreuses informations utiles : informations sur les produits et accessoires, guides d'utilisation, logiciel de configuration et de documents techniques qui peuvent être accessibles 24h/24.

### Contact

Si vous avez des problèmes techniques ou ne pouvez pas trouver les informations requises dans les documents fournis, contactez notre support technique via notre site Web, rubrique « Support Technique ». Cela permet de s'assurer que votre demande soit traitée le plus rapidement possible.

### Informations utiles lorsque vous contactez notre support technique

Lorsque vous contactez le support technique merci de vous munir des informations suivantes :

- Type de produit
- Version du firmware (par exemple V1.0.0)
- Description claire de votre question ou de votre problème
- Vos coordonnées complètes

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# EU Declaration of Conformity

**WE**

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04.76.92.01.62  
www.adeunis.com

**Declare that the DoC is issued under our sole responsibility and belongs to the following product:**

Apparatus model/Product: AMR GATEWAY  
Type: ARF8011BAx, ARF8011BBx, ARF8011BCx, ARF8011BDx,  
ARF8011BEx

**Object of the declaration:**



The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

- Directive 2014/53/UE (RED)**
- Directive 2011/65/UE (ROHS)**

**The following harmonised standards and technical specifications have been applied:**

Title:	Date of standard/specification
EN 300 220-2 V3.1.1	2017/02
EN 301 489-1 V2.1.1	2016/11
EN 301 489-3 V2.1.0	2016/09
EN 60950-1	2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013
EN 62311	2008
EN50385	2002
EN50581	2012

June, 12<sup>th</sup>,2016

Monnet Emmanuel, Certification Manager

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# Déclaration UE de Conformité

## Nous

Adeunis  
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Déclarons que la DoC est délivrée sous notre seule responsabilité et fait partie du produit suivant :

Modèle produit : GATEWAY AMR  
Référence : ARF8011BAx, ARF8011BBx, ARF8011BCx, ARF8011BDx,  
ARF8011BEx

## Objet de la déclaration:



L'objet de la déclaration décrit ci-dessus est conforme à la législation d'harmonisation de l'Union applicable :

**Directive 2014/53/UE (RED)**  
**Directive 2011/65/UE (ROHS)**

## Les normes harmonisées et les spécifications techniques suivantes ont été appliquées :

<b>Titre :</b>	<b>Date du standard/spécification</b>
EN 300 220-2 V3.1.1	2017/02
EN 301 489-1 V2.1.1	2016/11
EN 301 489-3 V2.1.0	2016/09
EN 60950-1	2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013
EN 62311	2008
EN50385	2002
EN50581	2012

10 Avril 2018

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## 1. Safety instructions

### 1.1. Environmental recommendations

All unnecessary packing materials have been eliminated. We have made every possible effort to ensure that the packaging can easily be separated into three types of materials: cardboard (box), expandable polystyrene (buffer material) and polyethylene (bags and protective foam layer). Your appliance is composed of materials that can be recycled and reused if it is dismantled by a specialist company. Please respect local regulations concerning the method of disposal of old packaging materials, worn out batteries and your previous equipment.

### 1.2. Warnings



Valid for AMR gateways references : ARF8011BA



Read the instructions contain in the user guide.



Security provided by this product is only ensured for use for its intended purpose. Maintenance can only be performed by qualified personnel.



**Warning**, when the equipment is opened, do not perform operations other than those specified in this manual.



**Warning** : Do not open the product, electric shock.



**Warning** : For your safety, it is imperative that before any technical work on the equipment it is turned off (via the supplied mains version).



**Warning** : when the antenna is installed outside (external antenna version), it is imperative to connect the cable shield to the ground of the building. It is recommended to use a protection against lightning. Protection kit selected must allow grounding of the coaxial cable (eg coaxial lightning arrester with grounding cable at different locations at the bottom of the antenna tower and entrance, or just before enter the premises).

Requires that the product is equipped with a disconnecting means to power off the power. It should be close to the equipment.

Dangerous voltages are present in the product (other than mains). Before any work they must also be cut.

All electrical connections to the product must be equipped with a protective device against overload and short circuits..

### 1.3. Usage Recommendations

- Before using the system, check that the supply voltage specified in its user manual corresponds to your power source. If this is not the case consult your supplier.
- Place the appliance against a flat firm and stable surface.
- The appliance should be installed in a location that is sufficiently ventilated to eliminate any risk of internal overheating and should not be covered by objects such as newspapers, cloths, curtains, etc.
- The appliance's aerial should be in the open and at least 10 cm clear of any conducting material
- The appliance should never be exposed to sources of heat such as heating appliances.
- Do not place the appliance close to objects producing open flames such as candles, welding torches, etc.
- The appliance should not be exposed to aggressive chemical products or solvents that could affect the plastic materials or corrode metal components.
- Install your appliance close to its DC power source (mains power version).

### 1.4. Waste disposal by users in private households in the European Union



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it to a designated collection point for the recycling of electrical and electronic equipment. The separate collection and waste your time of disposal recycling will help to conserve natural resources and ensure a sound recycling environment and human health. For more information about the recycling center nearest your home, contact the nearest service hall of garbage disposal service or the shop where you purchased the product.

## 2. Main Features

The adeunis® AMR Gateway is a wireless data concentrator.

This Gateway allows to collect frames from radio transmitters (meters, sensors, heat cost allocators ...) using the Wireless M-Bus protocol (EN13757) and send them as files to a remote FTP server , via a GPRS network.

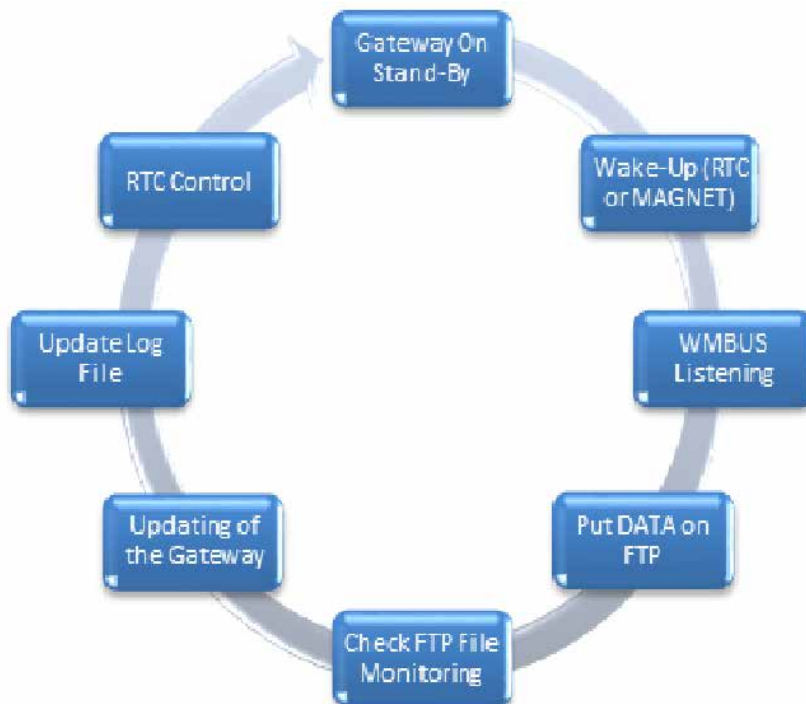
Markets covered by the AMR Gateway are the metering (automatic meter reading) and energy efficiency in the building (BMS / BAS).

### 2.1. Operating principle



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### 2.2. Gateway cycle operation



### 2.3. Technical specifications

Wireless M-Bus 868MHz interface	
Modes	T1, S1, R, C, T+C
RF power	14dBm (25mW)
RF sensitivity	up to -117dBm
Frequencies	868-870MHz (12 channels)
RF data rates	4.5/32/100kbps
Security	AES128/OMS mode 5 (option)
Range	up to 600m
GPRS interface	
Module	GSM/DCS GPRS
Sensitivity	-106dBm @850/900MHz
ETSI GSM	E-GSM850/900/1800/1900MHz
GPRS	Class B class 10
IMEI	internal
SIM card	internal, not accessible
Consumption & needs	
Power supply	Self powered
Autonomy	11 years typical
General information	
Storage / Operating temperatures	-40/+85°C -10/+60°C
Casing and protection	IP67 & IK8 standards
Dimensions	138 x 80 x 58.5mm
Weights	485gr
Standards	EN300-220, EN301-489, EN60950, EN13757-4

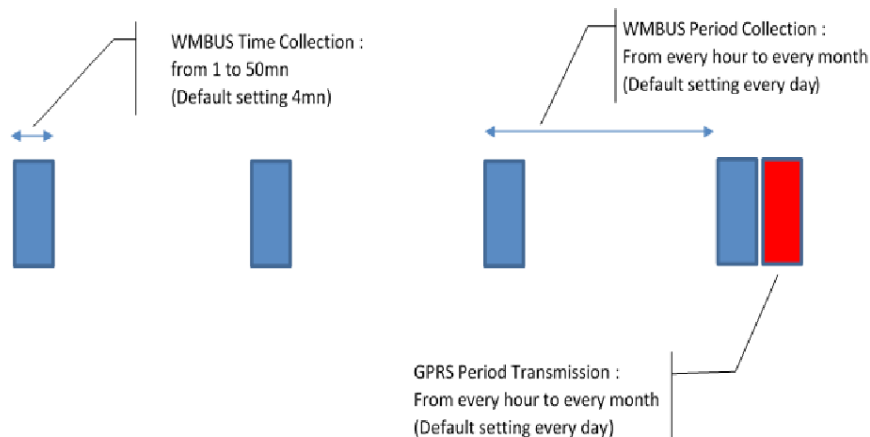
#### 2.3.1 Default configuration

By default, irrespective of the version, the configuration of the AMR Gateway is the following :

WMBUS listening period	WMBUS mode	GPRS connection	WMBUS Frame length
4 minutes / day	T1	1 per day	160 bytes

#### 2.3.2 Principles of collection period, WMBUS periodicity and GPRS sending periods

Example: 4mn Wmbus collection, every 6 hours, and one GPRS connection per day.  
 In the example below 4 periods of listening / collection WMBUS 4 min each, followed a GPRS connection.





### 2.3.3 Autonomy table

Depending on WMBUS listening cycles and the number of GPRS, the autonomy of self-powered versions of the AMR gateway may vary. Below is a table showing autonomies generally recognized.

Initial file size	File type	Real size to transfer	WMBus duration	WMBus periodicity	GPRS periodicity	Autonomy (in year)
20ko	Compressed	12ko	4mn	12h	12h	6,1
20ko	Compressed	12ko	4mn	6h	6h	3,6
20ko	Compressed	12ko	4mn	4h	4h	2,5
20ko	Compressed	12ko	4mn	2h	2h	1,3
20ko	Compressed	12ko	4mn	1h	1h	0,7
20ko	Compressed	12ko	2mn	12h	12h	7,1
20ko	Compressed	12ko	2mn	6h	6h	4,4
20ko	Compressed	12ko	2mn	4h	4h	3,1
20ko	Compressed	12ko	2mn	2h	2h	1,7
20ko	Compressed	12ko	2mn	1h	1h	0,9
5 ko	Binary	5 ko	4mn	24h	24h	10,7
20ko	Binary	20ko	4mn	24h	24h	8
20ko	Compressed	12ko	4mn	24h	24h	9,2
20ko	Binary	20ko	2mn	24h	24h	8,9
20ko	Compressed	12ko	2mn	24h	24h	10,4
20ko	Compressed	12ko	2mn	24h	7j	11
20ko	Compressed	12ko	2mn	7j	7j	15

### 2.3.4 Frame length / storage ratio

The AMR Gateway embeds a microcontroller / EEprom capable of storing data from transmitters (up to 50Kbytes), until the next GPRS transmission.

Depending on the length of the WMBUS frames (EN13757 standard gives a maximum of 255 bytes by frame), storage capacity varies. Below is a table of the storage capacities (example) of the AMR Gateway.

Example of WMBUS frame length (in bytes)	Number of transmitters received and stored in memory
60	800
100	500
160	300
250	200

**Note** : during the 4 minutes of listening, the WMBUS received frames are identified by the AMR Gateway. A received frame will be stored only once during this period. This mechanism avoids the memory to be overloaded by products emitting very often.

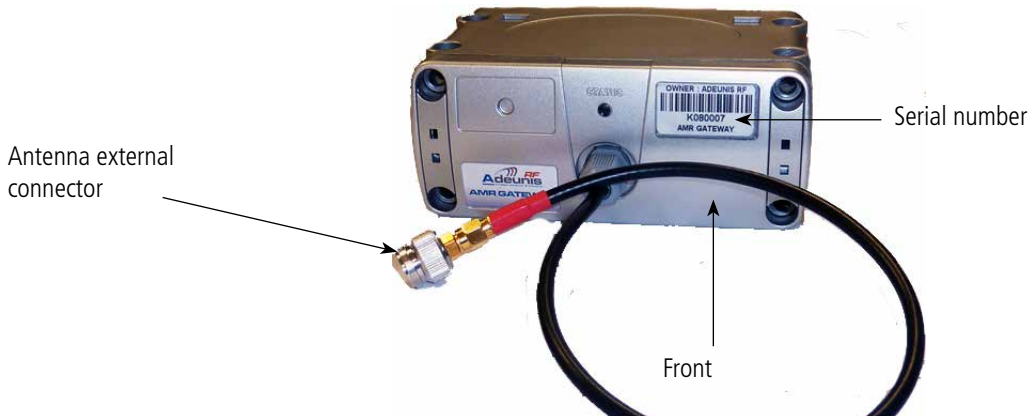
## 2.4. General description

Note: the term «external antenna» means 868MHz antenna for receiving frames WMBUS

### 2.4.1 External antenna / Self-powered version ARF8011BA

AMR gateways external antenna version are supplied with the following accessories :

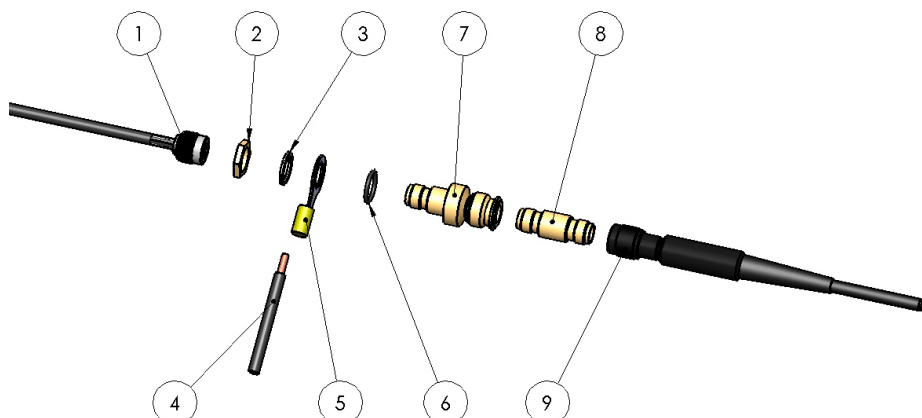
- 868MHz antenna / antenna holder + fasteners / antenna holder adaptor/ TNC extension cable



### 2.4.2 Protection of External antenna Gateway against overloads

It is necessary to protect the product against lightning. When the product is positioned high up it can potentially be struck by lightning which results in irreversible damage to the product. All lightning arrester systems can be installed between the aerial and the AMR Gateway. It is important to follow the manufacturer’s recommendations. The diagram below shows an example of a lightning arrester installation.

N°	Description	Reference
1	TNC connector of ARF868 modem	
2	Mounting nut	delivered with product
3	Tooth lock washer	delivered with product
4	12-10 AWG wire (must be earthed)	
5	Round terminal	RS : 613-9429
6	O ring seal	delivered with product
7	Lightning arrester	RS : 111-658
8	Male-Male TNC adapter	RS : 193-7953
9	Aerial	



## 2.5. Mechanical installation - Optimizing Performance

### 2.5.1 AMR Gateway positioning

AMR Gateways, due to their IP67 protection can be installed outdoor without fear of weather. Nevertheless, some rules must be followed to ensure optimum performance at both the WMBUS frame reception and connection to the GPRS network.

The gateway must be installed in free field, distant from any conductive material of more than 10 cm. No metal barrier shall be located within one meter.

Install the gateway to a minimum height of 2m and not stuck to a wall, ideally shifted 20 cm (5-10 cm minimum).

### 2.5.2 Positioning of the external antenna

When using an AMR Gateway equipped with a remote antenna, we recommend that you use the antenna pack + adaptor supplied with the AMR Gateway.

The antenna should be installed in a free field, at least 10 cm away from any conducting material. There should be no metal obstacle within a range of less than one metre.

If the AMR Gateway is installed in a building, the aerial should be installed outside.

The co-axial cable should be as short as possible (memo: cable of 25m => 6db of attenuation => range divided by 2).

## 3. SIM card and GPRS connection

adeunis® AMR Gateway includes support for SIM card, not accessible to the user. Indeed, the IP67 and therefore sealing the gateway can only be ensured if the product is assembled and tested by adeunis®.

It is therefore necessary for the user to provide a SIM card to deunis® that will perform the installation thereof and all functional tests before shipment to the customer.

Mandatory :

- Fully functional M2M SIM card (customer subscription)
- FTP server IP address
- Account login
- Account password
- Directories, sub-directories created

All this information is necessary to ensure the proper functioning of the AMR bridge before delivery. The user will be free to change the following parameters by sending a configuration file :

## 4. FTP Organization

For each account of the FTP, the following organization has to be set:  
At the root of the account folders has to be created with the following syntax:



## 5. Gateway configuration

adeunis® AMR Gateway can be configured remotely by sending a XML file Type. This file, once established, is sent to the gateway during a GPRS connection.

Upon receipt of the file, the gateway identifies as a configuration file.

The gateway performs a reconfiguration and integrates new operating parameters

### 5.1. File description

The AMR Gateway use few files for the configuration :

- A configuration file who contain all the setting of the gateway
- A update file who contain information for updating configuration or firmware
- A log file for historical action on the gateway
- Specific file for define action on the gateway (like command and meter file)

#### 5.1.1 Configuration file

##### 5.1.1.1 File name

Type	Format	NamePart	CodePart	Example
XML File	NamePart_CodePart.xml	ASCII (Max 18 charact)	Numerical (Max 9 Characters)	config_1.xml

##### 5.1.1.2 File contents

The following information shows an example of a configuration XML file. The **colored** zones can be modified by user.

```
<?xml version="1.0" encoding="UTF-8"?>
<config>
<syst version="1"/>
<syst enable_serialize="no" retry_timeout="4" fragment="4000" auto_connection="no" quad_band="yes"/>
<syst address="193.28.233.151" knet_port="22020" address_bck="193.28.233.239" knet_port_bck="22016"/>
<syst apn="internet68" apn_bck="internet68"/>
<syst gprs_tmo="180" gsm_tmo="180" pincode="0000" login="ARF" password="admin"/>
<syst ntp_addr="fr.pool.ntp.org"/>
<wakeup uart="1"/>
<cust send_tmo="10800" si_flow="2" keep_alive="8"/>
<syst ftp_flag="1" ftp_mode="1" ftp_addr="91.235.138.86:21" ftp_login="gateway080029" ftp_pwd="Gate080029"
ftp_path="/DATA"/>
<syst ftp_maint_addr="91.235.138.86:21" ftp_maint_login="gateway080029" ftp_maint_pwd="Gate080029" ftp_maint_
path="/CONTROL"/>
<cust wmbus_tmo="10" wmbus_mode="7" max_meter="500" max_data_len="100" multi_frame="0" max_size_
save="200000" wmb_dump="1" wmb_ch="0"/>
<cust gprs_running_mode="2"/>
<cust file_aes="0" data_struct="1" output_format="2" file_gzip="0" aes_key="01020304050607080910111213141516"/>
<syst state="2" inst_d="0" inst_p="0"/>
<manuf id="4606" id="304c" id="0c11"/>
<cal tx="1" hh="1" dd="7fffffff"/>
<cal tx="1" hh="2" dd="7fffffff"/>
...
...
</config>
```

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### 5.1.1.3 Parameters

Description	Parameter	Format	Default	Comment
PIN Code	<syst pincode="" />	Num : 4	0000	Example : 0000
Login	<syst login="" />	Text	ARF	Operator Login
Password	<syst password="" />	Text	ADMIN	Operator Password
APN	<syst apn="" />	Text		APN use for GPRS connection Example : m2minternet
APN Back-up	<syst apn_bck="" />	Text		Same as APN (depending of operator)

#### WMBUS parameter

Description	Parameter	Format	Default	Comment
Listening duration	<wmb wmbus_tmo="" />	Num : 1 to 3000	180	Defined in second
Mode	<wmb wmbus_mode="" />	Num : 0 to 8 0 : S1 "SP" 1 : S1 "LP" 2 : R "One Way" 3 : T1 4 : R 5 : S2 "SP" 6 : T2 : T+C 8 : T1 12%	7	
WMBUS frame length	<wmb max_data_len="" />	Num : 1 to 255	255	Maximum WMBus frame length
Number of meters	<wmb max_meter="" />	Num : 1 à 5000	100	Maximum number of meter to collect per receive period
Reject Meter Already Memorized	<wmb multi_frame="" />	0 : unactivate 1 : activate	0	Multiframe function to receive different frames form a single meter
Manufacturer ID Filtering	<manuf id="" id="" ... />	See note (1)		

Note : (1) Manufacturer ID Filtering :

Add an option to choose with MANUF ID defined in 3 letters (ARF) or in hexacode (4606)

$$\begin{aligned}
 \text{MAN. ID} = & \quad [ASCII(1st\ letter) - 64] * 32 * 32 & \quad \text{ARF : } [65-64] * 32 * 32 = 1024 \\
 & + [ASCII(2nd\ letter) - 64] * 32 & \quad [82-64] * 32 = 576 \\
 & + [ASCII(3rd\ letter) - 64] & \quad [70-64] = 6
 \end{aligned}$$

Result : 1024 + 576 + 6 = 1606 -> 0x0646 -> Manuf ID 4606

Max of 10 MANUF ID can be set in the config file. The manufacturer ID can be enter in ASCII or NUMBER (example : ARF or 0646)

**If no manufacturer ID is wanted. This line must be removed.**

#### FTP parameters

Description	Parameter	Format	Default	Comment
Address	<cust ftp_addr="" />	IP or text		IP address for data
Port	See note (1)	Num	21	Communication por for data
Path	<cust ftp-path="" />	Text	/	Path for data
Login	<cust ftp_login="" />	Text		Login to use for FTP connection

Description	Parameter	Format	Default	Comment
Password	<cust ftp_pwd="" />	Text		Password to use for FTP connection
Maintenance Address	<cust ftp_maint_addr="" />	IP or text		IP address for monitoring file
Port Maintenance	See note(1)	num	21	Communication port for monitoring file
Path Maintenance	<cust ftp_maint_path="" />	text	/	Only manufacturing setting
Login Maintenance	<cust ftp_maint_login="" />	Text		Login to use for FTP connection
Password Maintenance	<cust ftp_maint_pwd="" />	Text		Password to use for FTP connection

Note (1): The port parameter must be add at the end of the address parameter with ":"

Example : 91.235.138.86:21

### Data format parameters

Description	Parameter	Format	Default	Comment
Output file format	<cust output_format="" />	2	2	2 : GP2 File
Compressed File	<cust file_gzip="" />	0 - 1	0	0 : Inactive 1 : Active
Encryption	<cust file_aes="" />	0 - 1	0	0 : Inactive 1 : Active
AES Key	<cust aes_key="" />	32 bytes	010203...	AES Key to use

### Wake up parameters

Description	Parameter	Format	Default	Comment
Wake Up Day	<cal dd="" />	8 bytes	7fffffff (1)	1 bytes per day
Wake Up Hour	<cal hh="" />	0 to 23	1	Hour number
Wake Up GPRS	<cal tx="" />	0 - 1		0 : No 1 : Yes

**cal** : the calendar of wake up/transmission ( the list of rules is limited to 24 ).

The fields are:

**dd** : hexadecimal mask hexadecimal using 32 bits (maximum 31 bits used) representing the days of the month (the reference is the first of the month) when the gateway should wake-up. If the month contains less than 31 days, the corresponding bits are ignored.

**hh** : Base time for wake-up ( UTC time), To avoid BTS saturation problem if too many gateway try to connect at the same time, the wake-up time is spread on a 1 hour base. The spread algorithm for wake-up time is :

**tx** : send or not send file to the server

Example for one profile: 1 wmbus reception per day / 1 file transfer send per week:

```
<cal dd=>10204081» hh=>1» tx=>1»/> <cal dd=>6FDFBF7E» hh=>1» tx=>0»/>
```

Example for one profile: 1 wmbus reception per day / 1 file transfer per day at 1h00 :

```
<cal dd=>7FFFFFFF» hh=>1» tx=>1»/>
```

Example for one wmbus reception per hour and 1 file transfer per day at midnight every day:

```
<cal dd="7FFFFFFF" hh="0" tx="1"/>
<cal dd="7FFFFFFF" hh="1" tx="0"/>
<cal dd="7FFFFFFF" hh="2" tx="0"/>
<cal dd="7FFFFFFF" hh="3" tx="0"/>
<cal dd="7FFFFFFF" hh="4" tx="0"/>
<cal dd="7FFFFFFF" hh="5" tx="0"/>
...
...
...
<cal dd="7FFFFFFF" hh="17" tx="0"/>
<cal dd="7FFFFFFF" hh="18" tx="0"/>
<cal dd="7FFFFFFF" hh="19" tx="0"/>
<cal dd="7FFFFFFF" hh="20" tx="0"/>
<cal dd="7FFFFFFF" hh="21" tx="0"/>
<cal dd="7FFFFFFF" hh="22" tx="0"/>
<cal dd="7FFFFFFF" hh="23" tx="0"/>
```

**Operation mode parameters**

Description	Comments
Park (state = 1)	No parameter -> The gateway return to an unconnected mode. The gateway must be reactivated with a magnet.
Operation (state = 2)	Normal mode. No specific parameters
Installation (state = 2 + parameters inst_d-inst_p)	Time period : min 1 – max : 65535 (in minute) If value 0 -> Installation mode inactivated  Min : 1 – max : 1440 (in minute)

Description	Parameter	Format
Scan period	<syst inst_d=""/>	Num : 1-65535
Period between scan	<syst indt_p=""/>	Num : 1 -1440
Running mode	<syst state=""/>	1 or 2 See note(1)

**5.1.2 Upgrade File**

**5.1.2.1 File name**

Type	Format	SerialPart	NamePart	Example
XML File	SerialPart_NamePart.xml	Numerical (Gateway Serial Number)	upgrade	02 <b>08001A</b> _upgrade.xml

The Name part contain the serial number of the gateway + other number  
For the gateway **K08001A** ->Take the serial number without the first letter (K)

**5.1.2.2 File contents**

The following information shows an example of a configuration XML file. The **colored** zones can be modified by user.

```
<config version="1" file="config_1.xml"/>
<firmware version="3.0.0" file="amrgateway_3.0.0.tar"/>
```

### 5.1.2.3 Parameters

Description	Parameter	Format	Default
Config File Version	<config version="" />	Num	1
Config File Name	<config file="" />	Text	config
Firmware Version	<firmware version="" />	Text	3.0.0
Firmware Name	<firmware file="" />	Text	amrgateway

### 5.1.3 Command file

The command file is used to clear all meter filtering enter in the gateway. The file will be remove from the FTP server since it take in charge by the gateway.

#### 5.1.3.1 File name

Type	Format	SerialPart	NamePart	Example
XML File	SerialPart_NamePart.xml	Numerical (Gateway Serial Number)	upgrade	02 <b>08001A</b> _command.xml

The Name part contain the serial number of the gateway + other number  
For the gateway **K08001A** -> Take the serial number without the first letter (K)

#### 5.1.3.2 File Contents

The following information shows an example of a configuration XML file. The colored zones can be modified by user.

```
<prov clearmeter="" />
```

#### 5.1.3.3 Parameters

Description	Parameter	Format	Default
Command	<prov clearmeter="" />	None	

### 5.1.4 Meter File

The meter file is used to send to the gateway a list a meter the user want to filter. The file will be remove from the FTP server since it take in charge by the gateway.

#### 5.1.4.1 File name

Type	Format	SerialPart	NamePart	Example
TXT File	SerialPart_NamePart.xml	Numerical (Gateway Serial Number)	meters	02 <b>08001A</b> _meters.txt

The Name part contain the serial number of the gateway + other number  
For the gateway **K08001A** -> Take the serial number without the first letter (K)

#### 5.1.4.2 File contents

The following information shows an example of a configuration XML file. The **colored** zones can be modified by user.

```
460638020500E708  
460660020500E708
```

#### 5.1.4.3 Parameters

Description	Parameter	Format	Default
Meter Serial Number	MANUF ID + S/N	HEX (8 bytes)	None



### 5.1.5 Log file

After receiving the file(s), the AMR Gateway creates or appends his assigned log file contains in the log folder.

#### 5.1.5.1 File name

Type	Format	SerialPart	NamePart	Example
TXT File	SerialPart_NamePart.xml	Numerical (Gateway Serial Number)	log	02 <b>08001A</b> _log.txt

The Name part contain the serial number of the gateway + other number  
For the gateway **K08001A** -> Take the serial number without the first letter (K)

#### 5.1.5.2 File Contents

[1449844600 ; 0x0A ; 3.0.0 ; 1]

#### 5.1.5.3 Parameters

Description	Value	Format	Default
Timestamps	1449414600	Num	Number of second since 1/1/1970
Status	0x01 : Firmware received 0x02 : Config received 0x04 : Firmware installed 0x08 : Configuration installed 0x10 : Firmware installation failure 0x20 : Meter list received 0x40 : Meter list successfully installed 0x80 : Meter list install failed	Hex	0x0A : Configuration received & Installed
Firmware version	3.0.0	Text	3.0.0
Config version	1	Num	1

## 6. File data

### 6.1. Extension

#### 6.1.1 Compression

The compression function can be activated or deactivated from the configuration file. The compression method used is Gzip format. For RAM limitation reason, the file are cut in 20 kbyte part before compression. Each file has the complete format described in previous paragraph and can be processed independently.

The compressed files use .gz extension. Example : **0999208001A\_140402\_011821.gp2.gz**

#### 6.1.2 Encryption

The encryption can be activated or deactivated from the configuration file.

The encryption use is AES 128 CBC with:

- Default value : 01020304050607080910111213141516
- Initial vector : **Please contact us**
- Padding: The padding to get complete block length of 16 byte is done with the value that is the number of padding bytes (1..16). Even if the length of data is already a multiple of the block length. So for the decryption the last byte is guaranteed to be a pad byte indicating the total number of padded bytes. This is why the output buffer should be at least 16 bytes larger than the input buffer.

The .aes extension is used for this file

**Example : 0999208001A\_140402\_011821.gp2.aes**

### 6.1.3 Compression + encryption

Both option can be activated for file. The file will used both extension : .gz + .aes

Example : 0999208001A\_140402\_011821.gp2.aes.gz

## 6.2. Decryption file

### 6.2.1 File format

When the FTP server connection is established, the gateway sends a GP2 file  
This file consists of information concentrated by the gateway since the last connection :

#### Filename

0999 + Gateway serial number\_YYMMDD\_HHMMSS.GP2

#### Example :

0999200099e\_130513\_120103.GP2

--> this file comes from AMR Gateway 2000099e

--> this file has been created on May 13th, 2013 at 12h01mn03

### 6.2.2 Hexadecimal format

Example :

22 13 11 07 15 42 56 b5 19 44 30 4c 07 00 00 00 00 00 a1 61 3f 03 13 97 87 73 98 4f 04 03 41 9f e9 86 22 13 11 07  
15 42 56 6c 19

### 6.2.3 First part

#### Start byte and frame date/time

Start byte : frame length : 0x22

#### Date and time

Then from the second to the seventh byte : year, month, day, hour, min., sec.  
YEAR.MONTH.DAY.HOUR.MIN.SEC

Example :

13 11 07 15 42 56 for a frame received November, 7th 2013 at 15h42mn56s

### 6.2.4 Second part

The next byte is the RSSI level : 0xB5

This value is coded in two's complement on 8 bits

Hexadecimal Value	Binary Value	Inverse binary value	Add +1	Relative Decimal Value	dBm Value
0xB5	1100 0101	0011 1010	0011 1011	59	-59 dBm

### 6.2.5 Third part

WMBUS frame length and frame type 44

In the given frame example, you'll find : 0x19 0x44

--> frame length : 0x19

--> frame type : 0x44

### 6.2.6 Last part

#### WMBUS frame

Example : **30 4c 07 00 00 00 00 00 a1 61 3f 03 13 97 87 73 98 4f 04 03 41 9f e9 86 22 13 11 07 15 42 56 6c 19**

WMBUS frame starts with Manufacturer ID, product ID and then the DATA.

### 6.3. Next frame

The file will start with a new frame starting with frame length : 0x22

### 6.4. Gateway informations

At the end the file file, you will find information about the gateway :

Data is encoded in Little Endian.

1st byte : Start (0xFF)

2nd byte : Meter type (0x13)

3rd byte : Meter type lenght (0x45)

4th byte : Wmbus maint 2 type (0x1A)

5th byte : Wmbus maint 2 type lenght 2 (0x43)

45 following bytes : Maintenance structure in the following format:

- 8 bytes : Accumulated current consumed from the battery insertion (in  $\mu$ A.s)
- 4 bytes : Battery insertion UTC timestamp (in seconds)
- 4 bytes : Number of awakenings of the gateway from manufacturing
- 4 bytes : Cumulative working time in seconds
- 4 bytes : Reserved
- 2 bytes : Mobile Country code
- 2 bytes : Mobile Network code
- 2 bytes : Number of valid frames received
- 2 bytes : Number of meters reported in the database, held during the last reading
- 2 bytes : Number of meters attached to the gateway
- 2 bytes : Number of meters detected with the expected manufacturer(s) ID(s)
- 2 bytes : Number of frames received with the expected manufacturer(s) ID(s)
- 1 byte : GSM RSSI
- 1 byte : Internal batteries voltage (in tenth of volts)
- 1 byte : External batteries voltage (in tenth of volts)
- 1 byte : Version soft : Major
- 1 byte : Version soft : Minor
- 1 byte : Version soft : Subminor
- 1 byte (signed) : Internal temperature of the Gateway
- 50th byte : Type CID (0x14)
- 51st byte : CID lenght type (0x14)
- 20 following bytes : SIM card ICCID

## 7. Document history

User guide version	Contents
V2.5.2	Update Graphical Charter
V2.5.1	Update Déclaration of conformity
V2.5	Update Déclaration of conformity
V2.4	Modification RSSI coding
V2.3	Declaration of Conformity updated
V2.2	New autonomy value
V2.1	Starting procedure modified
V2.0	Document created