

# ADR Project. Meter Interfaces

Rev.1.1

## Revision history

Version	Date	Description
1.0	14.05.2025	First document revision
1.1	10.04.2026	Changes in protocol stack description for NB-IoT

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## Local communication interfaces

The meter may have one of the following communication interfaces or both simultaneously: NFC (Near Field Communication), BLE (BlueTooth Low Energy).

### **NFC**

The protocol stack looks like following:

<b>Application layer</b>	DLMS/COSEM IEC 62056-5-3
<b>Data Link layer</b>	HDLC IEC 62056-46
<b>Physical layer</b>	ISO/IEC 15693 at 13.56 MHz Communication mail box address = 0x008 Maximum frame length = 240 byte

DLMS/COSEM is used as application layer protocol. This means all application data is modeled as COSEM objects and is transmitted in DLMS formatted messages. For details see “ADR Project. DLMS/COSEM Profile” and “ADR Project. DLMS/COSEM Events, Alarms”.

### **BLE**

BLE communication protocol stack is based on Smart Bluetooth (Bluetooth Low Energy) specification v.5.0 (with 4.0 backward compatibility) and uses IEC 62056-5-3 (DLMS/COSEM) as application layer protocol.

The protocol stack looks like following:

<b>Application layer</b>	DLMS/COSEM IEC 62056-5-3
<b>Convergence sublayer</b>	IEC 62056-47
<b>Data Link layer</b>	Proprietary GATT
<b>Physical layer</b>	LL + LE Phy 2.4 GHz

BLE data link layer uses several standard GATT profiles and one proprietary GATT profile “DLMS/COSEM”.

After connection established client must agree MTU size equal 250 bytes.

Following services are supported:

Service	Characteristic	Comment
GAP (UUID=0x1800)	Device Name (UUID=0x2A00)	“ADR-0001234567”
	Appearance (UUID=0x2A01)	Cat: 2-Computer, Sub: 0- Generic
GATT (UUID=0x1801)	Client Characteristic Configuration	0x0001 - Notifications enable

	(UUID=0x2902)	0x0002 - Indications enable
Device Information (UUID=0x180A)	Serial Number String (UUID=0x2A25)	“1234567”
	Hardware Revision String (UUID=0x2A27)	“8006”
	Firmware Revision String (UUID=0x2A26)	“v.1.4.1.5”
Current Time (UUID=0x1805)	Current Time (UUID=0x2A2B)	Read/Write current time
DLMS/COSEM (UUID=005a02fe-bea5-46a0-c000-73c0d9b578fc)	Metering Interface (UUID=005a02fe-bea5-46a0-c101-73c0d9b578fc)	Read/Write DLMS/COSEM commands

DLMS/COSEM is used as application layer protocol. This means all application data is modeled as COSEM objects and is transmitted in DLMS formatted messages. For details see “ADR Project. DLMS/COSEM Profile” and “ADR Project. DLMS/COSEM Events, Alarms”.

## LPWAN interfaces

Meter may have dual-mode LoRaWAN + unidirectional wM-Bus RF interface and/or NB-IoT interface to transmit measurement data to data acquisition systems.

### LoRaWAN

LoRaWAN communication protocol complies with the LoRaWAN 1.0.4 Specification and uses proprietary application layer protocol.

The protocol stack looks like following:

<b>Application layer</b>	Proprietary
<b>Data Link layer</b>	LoRaWAN Specification Version : V1.0.4  LoRaWAN Region: EU863-870  LoRaWAN Regional Parameters Version: REP002-V1.0.4  Class of Operation: A
<b>Physical Layer</b>	LoRa PHY

LoRaWAN interface application layer is described in “ADR Project. LoRaWAN Profile”.

### wM-Bus

wM-Bus communication protocol stack complies with the OMS v4.4.2 specifications.

The protocol stack looks like following:

<b>Application layer</b>	EN 13757-3:2018
<b>Transport Layer</b>	EN 13757-7:2018

<b>Authentication and Fragmentation Layer</b>	EN 13757-7:2018 clause 6
<b>Data Link layer</b>	EN 13757-2:2018 EN 13757-4:2019 Security mode 0 or 5
<b>Physical Layer</b>	EN 13757-4:2019 PHY_A mode T1 or C1 H <sub>T</sub> = Highest transmission power (> +5 dBm). Unidirectional synchronous transmission: transmit every 20 sec, interval of Consumption Data is 1 hour.

WM-Bus application layer M-Bus Dedicated Application Protocol. List of OMS-Data Points is described in “ADR Project. wM-Bus Profile”.

### ***NB-IoT***

The protocol stack looks like following:

<b>Application layer</b>	DLMS/COSEM IEC 62056-5-3
<b>Transport layer</b>	Wrapper IEC 62056-9-7
	UDP
<b>Network layer</b>	IPv4
<b>Physical layer</b>	LTE Rel.14 (Cat. NB2) B3, B8, B20 frequency bands

DLMS/COSEM is used as application layer protocol. This means all application data is modeled as COSEM objects and is transmitted in DLMS formatted messages. For details see “ADR Project. DLMS/COSEM Profile” and “ADR Project. DLMS/COSEM Events, Alarms”.