

ADR Project. DLMS_COSEM Events, Alarms.

Rev. 1.0

Revision History

Version	Date	Description
Rev. 1.0	13.05.2025	First document revision

1. Event and error handling

1.1 Events

There are 6 groups of events. Each group has its own event log, i.e., 6 event logs.

Every event has a unique code to identify the action which has triggered it. Every event is assigned to one event log and it is only stored there. This assignment is fixed and can't be changed dynamically.

Event Codes

Group	Name	Min Entries	Description
1	Standard	120	
2	Firmware	120	
3	Valve	120	
4	Communication	120/380	120 – without LoRaWAN
5	Security	120	
6	Manufacture	120	

Standard Event Log		
Number	Group	Event Description
1	1	Dry On (the water meter is not filled with water)
2		Dry Off
3		Reverse On (water flows in the opposite direction)
4		Reverse Off
5		Leak On (water flows for more than 24 hours in a row)
6		Leak Off
7		Burst On (water flow is constantly high for more than 30 minutes in a row)
8		Burst Off
9		Tamper (the water meter was opened)
10		Low battery
11		Normal battery
12		Hardware fault
13		Meter not calibrated
14		Coefficient changed
15		Program memory error
16		Measurement system error
17		Non volatile memory error
18		Watchdog
19		Inadmissible change of legally relevant software or device-specific parameters

20		Alarm register is cleared
21		Reserved
22		Clock object parameters changed
23		Billing profile configuration changed
24		Profile with period1 changed
25		Profile with period2 changed
26		Local display configuration changed
27		Reserved
28		Clock invalid
29		Hardware fault is over
30-35		Reserved
36		Security setup configuration changed
37		Changing security settings reading client
38		Changing security settings management client
39		Changing security settings firmware client
40		Reserved
41		Changing security policy for reading client
42		Changing security policy for management client
43		Changing security policy for firmware client
44		Reserved
45		Keys reset
46		Master key changed
47		Global unicast encryption key Changed
48		Authentication key changed
49-51		Reserved
52		Tamper is finished (the water meter was closed)
53		Low water temperature
54		Restart host MCU
55		Water temperature is normal
56		Battery lifetime is low
57		Battery lifetime is normal
58		Power saving mode on
59		Power saving mode off
60-100		Reserved
101		Changing errors GP30
102		Detection of decreased consumption GP30
103		Detecting large spike consumption
104		Mismatch between flow and consumption
105		No connection with GP30
106		Connection with GP30 restored
107		LSE stopped
108		LSE restarted
109		Reserved
110		Data accumulation error
111		Delta measure error
112-254		Reserved

255		Event log has been cleared
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Firmware Event Log		
Number	Group	Event Description
1	2	Firmware activated
2		Firmware ready for activation
3		Firmware image block transfer initiated
4		Firmware image block transfer finished
5		Firmware image verification initiated
6		Firmware image verification successful
7		Firmware image verification failed
8		Firmware image activation initiated
9		Firmware image activation failed
10		Firmware image block write error
11		Digital signature valid
12		Digital signature invalid
13-254		Reserved
255		Event log has been cleared

Valve Control Event Log		
Number	Group	Event Description
1	3	Valve is opened (by remote command)
2		Valve is closed (by remote command)
3		Valve communication error
4		Valve communication OK
5		Opening the valve cover
6		Closing the valve cover
7		Magnet impact - beginning
8		Magnet impact - end
9		The valve is 10 % open
10		The valve is 50 % open
11		Valve low battery
12		Valve normal battery
13		Valve depassivation
14		Valve hardware fault
15		Valve hardware fault is over
16		Change valve serial number non zero
17		Change valve serial number to zero
18		Valve serial number changed successful

19		Valve serial number changed error
20-254		Reserved
255		Event log has been cleared

Communication Event Log		
Number	Group	Event Description
1	4	WAN modem fault
2		WAN modem OK
3		Unsuccessful registration on the LoRaWAN server
4		Successful registration on the LoRaWAN server
5		LoRa sending
6		LoRa sent fault
7		LoRa sent ok
8		BLE restart by power reason
9		BLE restart by no answer reason
10		BLE restart by stack hang up reason
11		BLE restart by hang up reason
12		BLE restart by reason out of memory
13		NB-IoT: Module initialization failure
14		NB-IoT: SIM card failure
15		NB-IoT: SIM card ok
16		NB-IoT: Network registration failure
17		NB-IoT: Network registration ok
18		NB-IoT: PDP context established
19		NB-IoT: PDP context terminated
20		NB-IoT: PDP context failure
21		NB-IoT: Signal quality low
22		NB-IoT: Communication begin
23		NB-IoT: Communication ended successfully
24		NB-IoT: Communication failure
25-254		
255		Event log has been cleared

Security Event Log		
Number	Group	Event Description
1	5	Error changing master key
2		Error changing global unicast encryption key
3		Error changing authentication key
4		Error in transport messages with ciphering or authentication

5		Association with invalid password
6		Error changing security policy
7-254		Reserved
255		Event log has been cleared

Manufacture Specific Event Log		
Number	Group	Event Description
1	6	Reset STM32
2		Restart by stuck thread
3		STM32 hard fault
4		Fram hard fault
5-254		Reserved
255		Event log has been cleared

Payment Event Log (Optional)		
Number	Group	Event Description
1	7	STS reset credit
2		STS top up
3		STS key changed
4-254		Reserved
255		Event log has been cleared

1.2 Event Logs

The meter features 6 different event logs as described below. The event logs have different basic structure.

Standard Event Log [8-0:99.98.0.255]

Contains all events not recorded in a special event log, e.g. firmware update, etc.

Structure: Timestamp – Event Code

Minimum size: 120 entries

Firmware Events Logs (8-0:99.98.4.255)

Contains all events related to firmware change.

Structure: Timestamp – Event Code – Former Firmware Version – New Firmware

Minimum size: 120 entries

Valve Control Log [8-0:99.98.2.255]

Contains all events related to the valve, e.g. open, close.

Structure: Timestamp – Event Code – current valve control status –reason

Minimum size: 120 entries

Communication Event Log [8-0:99.98.7.255]

Contains all events related to communication.

Structure: Timestamp – Event Code (without LoRaWAN)

Minimum size: 120/380 entries (120 without LoRaWAN)

Security Event Log [8-0:99.98.11.255]

Contains all events related to security.

Structure: Timestamp – Event Code

Minimum size: 120 entries

Manufacture Specific Event Log [8-0:99.98.14.255]

Contains all events related to security.

Structure: Timestamp – Event Code – manufacture parameter

Minimum size: 120 entries

1.3 Alarm Handling

A selection of events can be made which are treated as alarms (alarm filter). If one of these events occurs, the corresponding flag in the alarm register is set.

Alarm Codes

The table below gives an overview of all possible alarms and their assignment.

Non Critical Alarms								Non Critical Alarms								Critical Alarms								Non Critical Alarms							
Byte 4								Byte 3								Byte 2								Byte 1							
8	4	2	1	8	4	2	1	8	4	2	1	8	4	2	1	8	4	2	1	8	4	2	1	8	4	2	1	8	4	2	1
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1.4 Alarm Filters

Depending on the capabilities of the CAS not all the possible alarms are wanted. Therefore an alarm filter (8-0:97.98.10.255) can be programmed to mask out unwanted alarms.

The structure of the filter is the same as for the alarm codes.