

DCC User Gateway Interface Design Specification

Annex - Service Request Definitions 15 - Device Alerts

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15 Device Alerts

Device Alerts are unsolicited messages generated by the Devices and forwarded by the DCC Data Systems to the DCC Service Users. The Alert recipient is defined in the Device response (Device Alert.. See GBCS for list of possible SMETS2 or later Device Alerts.

SMETS2 or later: The Device Alert GBCSPayload contains the Alert generated by the Device. For the "Billing Data Log" Device Alert, the GBCSPayload contains the Billing Data Log for the period specified in the Device's Billing Calendar.

The SMETS1 equivalent of a Device Alert is a SMETS1 Alert, as described in SEC.

This section should be read in conjunction with:

- SMETS2 or later: The Main Document of this documentation set section 9.3.2 (which describes the Device Alert Message Response format);
- SMETS1: The Main Document of this documentation set section 9.3.4, Annex 19 section 19.4 (which describe the SMETS1 Response Message format) and the SEC subsidiary document SMETS1 Supporting Requirements;
- the DUIS XML Schema XSD (document 3 of this documentation set);
- the MMC XML Schema XSD (document 4 of this documentation set).

15.1 Service Request

Service Requests are not applicable to Device Alerts, since they are unsolicited messages.

In the case of "Billing Data Log", Service Request "6.8 Update Device Configuration (Billing Calendar) sets the Billing Calendar on the Device (see Annex section 6) and this causes the Device to send "Billing Data Log" Device Alerts to the corresponding Supplier, according to the timetable defined in the Billing Calendar.

15.2 Responses

SMETS2 or later: The Service Response message for Device Alerts is defined by GBCS. The only response type applicable is

- Device Alert

SMETS1. The Service Response message for SMETS1 Alerts is defined in Annex 19 section 19.4.3.2. The only response type applicable is

- SMETS1 Response Message

For Device Alerts, the ResponseCode will always be I0. See Main Document of this documentation set section 12.3 for the full list of generic Error / Response Codes.

15.2.1 SMETS2 or later Device Alert Response – Sample XML

A sample SMETS2 or later Device Alert Response document is given in Annex Introduction Appendix 3. A sample of the body of the message is as follows:

```
<DeviceAlertMessage>
  <AlertCode>8F01</AlertCode>
  <GBCSPayload>ZGVmYXVsdA==</GBCSPayload>
</DeviceAlertMessage>
```

Figure 1 Sample Device Alert Response Format (SMETS2 or later) – Without Throttling

The Device Alert data sent by the SMETS2 or later Device is contained in the GBCSPayload. See GBCS for details.

A sample SMETS2 or later Device Alert Response document body for a "Billing Data Log" Alert is as follows:

```
<DeviceAlertMessage>
  <AlertCode>8F0A</AlertCode>
  <GBCSPayload>ZGVmYXVsdA==</GBCSPayload>
</DeviceAlertMessage>
```

Figure 2 Sample Device Alert (Billing Data Log) Response Format (SMETS2 or later) – Without Throttling

The SMETS2 or later Device Alert data, including the Billing Data Log, sent by the Device is contained in the GBCSPayload. See GBCS for details.

15.2.2 SMETS1 Alert Response – Sample XML

A sample SMETS1 Alert Response document is given in Annex Introduction Appendix 5. A sample of the body of the message is as follows:

```
<SMETS1ResponseMessage>
  <SMETS1SignedResponse schemaVersion="3.0">
    <SMETS1Response>
      <Header>
        <ra:BusinessOriginatorID>99-00-AA-BB-CC-DD-EE-FF</ra:BusinessOriginatorID>
        <ra:BusinessTargetID>11-22-33-44-55-66-77-88</ra:BusinessTargetID>
        <ra:OriginatorCounter>50</ra:OriginatorCounter>
      </Header>
      <Body>
        <DeviceAlertMessage>
          <ra:DeviceAlertContent>
            <ra:GBCSHexAlertCode>8F1C</ra:GBCSHexAlertCode>
            <ra:AlertDescription>xx fault</ra:AlertDescription>
            <ra:Timestamp>2017-08-25T03:04:05.00</ra:Timestamp>
          </ra:DeviceAlertContent>
        </DeviceAlertMessage>
      </Body>
    </SMETS1Response>
    <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
      <SignedInfo>
        <CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
        <SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#ecdsa-sha256" />
        <Reference URI="">
          <Transforms>
            <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
          </Transforms>
          <DigestMethod Algorithm="http://www.w3.org/2001/04/xmldsig#sha256" />
          <DigestValue>ZGVmYXVsdA==</DigestValue>
        </Reference>
      </SignedInfo>
      <SignatureValue>ZGVmYXVsdA==</SignatureValue>
    </KeyInfo>
    <X509Data>
      <X509IssuerSerial>
        <X509IssuerName>CN=S1SP,OU=SMETS1,O=S1SP,L=london,ST=england,C=uk</X509IssuerName>
        <X509SerialNumber>7432112348</X509SerialNumber>
      </X509IssuerSerial>
    </X509Data>
  </KeyInfo>
</Signature>
</SMETS1SignedResponse>
</SMETS1ResponseMessage>
```

Figure 3 Sample SMETS1 Alert Response Format (SMETS1) – Without Throttling

15.2.3 Throttling of Device and SMETS1 Alert Messages

The sending of Device Alerts and SMETS1 Alerts to DCC Service Users may be limited by throttling. See DUGIDS main document section 2.12 for a description of the throttling of Alerts.

The following is a sample of the body of a SMETS2 Device Alert where the sending of Device Alerts to a DCC Service User has been reduced by throttling.

```
<DeviceAlertMessage>
  <AlertCode>8F01</AlertCode>
  <ThrottledAlertSequenceId>97311</ThrottledAlertSequenceId>
  <ThrottledAlertCount>499</ThrottledAlertCount>
  <GBCSPayload>ZGVmYXVsdA==</GBCSPayload>
</DeviceAlertMessage>
```

Figure 3.2 Sample Device Alert – With Throttling

The following is a sample of a SMETS1 Alert where throttling has been used to reduce the number of SMETS1 Alerts being sent to a DCC Service User. Where SMETS1 Alerts are throttled, the throttling information is added inside the SMETS1ResponseMessage element,

```
<SMETS1ResponseMessage>
  <ThrottledAlertSequenceId>97311</ThrottledAlertSequenceId>
  <ThrottledAlertCount>499</ThrottledAlertCount>
  <SMETS1SignedResponse schemaVersion="3.0">
    <SMETS1Response>
      <Header>
        <ra:BusinessOriginatorID>99-00-AA-BB-CC-DD-EE-FF</ra:BusinessOriginatorID>
        <ra:BusinessTargetID>11-22-33-44-55-66-77-88</ra:BusinessTargetID>
        <ra:OriginatorCounter>50</ra:OriginatorCounter>
      </Header>
      <Body>
        <DeviceAlertMessage>
          <ra:DeviceAlertContent>
            <ra:GBCSHexAlertCode>8134</ra:GBCSHexAlertCode>
            <ra:AlertDescription>xx fault</ra:AlertDescription>
            <ra:Timestamp>2017-08-25T03:04:05.00</ra:Timestamp>
          </ra:DeviceAlertContent>
        </DeviceAlertMessage>
      </Body>
    </SMETS1Response>
    <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
      <SignedInfo>
        <CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#">
        <SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#ecdsa-sha256">
        <Reference URI="">
          <Transforms>
            <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature">
            </Transforms>
            <DigestMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#sha256">
            <DigestValue>ZGVmYXVsdA==</DigestValue>
          </Reference>
        </SignedInfo>
        <SignatureValue>ZGVmYXVsdA==</SignatureValue>
      </KeyInfo>
      <X509Data>
        <X509IssuerSerial>
          <X509IssuerName>CN=S1SP,OU=SMETS1,O=S1SP,L=london,ST=england,C=uk</X509IssuerName>
          <X509SerialNumber>7432112348</X509SerialNumber>
        </X509IssuerSerial>
      </X509Data>
    </KeyInfo>
  </Signature>
</SMETS1SignedResponse>
</SMETS1ResponseMessage>
```

Figure 3.3 Sample SMETS1 Alert – With Throttling

15.3 SMETS2 or later Parse Output Format

This section describes the information which will be sent with SMETS2 or later Device Alerts in GBCS payload to DCC Service Users.

There are some Device Alerts defined in GBCS which are sent to the DCC for other purposes and are not forwarded to DCC Service Users as GBCS payload, so those are not in the Parse Output and are not included here.

15.3.1 Message codes for Device Alerts

All Device Alerts will have both a Message Code and an Alert Code. Most Device Alerts will use one of the generic Message Codes 0x1000 (Critical) or 0x1001 (Non Critical).

A small number of Device Alerts use a specific Message Code instead of one of the generic ones, as defined in GBCS. Where this is the case they are listed in the table below. This table identifies the Message Codes which correspond to Device Alerts rather than GBCS Commands.

The Device Alerts which have specific Message Codes rather than the generic ones in the table all carry additional payload, and there are also some Device Alerts which use the generic Message Codes in the table below and carry additional payload. See section 15.3.3 for details of Device Alerts that carry additional payload. Note that a given version of MMC only supports those Device Alerts with additional payload included in the GBCS version it aligns to. For example MMC version 1.0 doesn't include Device Alert 81A0.

MMC XSD Version	GBCS Version	Message Code	Purpose	Alert Codes
>= 1.0	>= 1.0	0061	GBCS use case ECS68 ESME Critical Sensitive Alert (Billing Data Log)	8F0A
>= 1.0	>= 1.0	0067	GBCS use case ECS80 Supply Outage Restore Alert from ESME	8F35, 8F36, 8F37, 8F38, 8F39, 8F3A, 8F3B, 8F3C
>= 1.0	>= 1.0	008B	GBCS use case GCS53, GSME Push Billing Data Log as an Alert	8F0A
>= 1.0	>= 1.0	00CA	Future Dated Firmware Activation Alert	8F66, 8F67
>= 1.0	>= 1.0	00CB	Future Dated Updated Security Credentials Alert ¹	8F66, 8F67
>= 1.0	>= 1.0	00CC	Future Dated Execution Of Instruction Alert (DLMS COSEM)	8F66, 8F67
>= 1.0	>= 1.0	00CD	Future Dated Execution Of Instruction Alert (GBZ)	8F66, 8F67
>= 1.0	>= 1.0 and modified in 4.1	00CE	Firmware Distribution Receipt Alert (ESME/HGALCS ³)	8F72, 8F1C
>= 1.0	>= 1.0	00CF	Firmware Distribution Receipt Alert (GSME)	8F72, 8F1C
>= 2.0	>= 2.0	00F0	Meter Integrity Issue Warning Alert - ESME	81A0
>= 2.0	>= 2.0	00F2	Meter Integrity Issue Warning Alert - GSME	81A0
>= 1.0	>= 1.0	1000	Generic Critical Alert	See GBCS for full list of Device Alert Codes
>= 1.0	>= 1.0	1001	Generic Non Critical Alert	See GBCS for full list of Device Alert Codes
>= 4.0	>= 4.0	0120	GBCS Use Case ECS100 Command not supported by Device.	8F85

MMC XSD Version	GBCS Version	Message Code	Purpose	Alert Codes
>= 4.0	>= 4.0	0123	GBCS Use Case ECS200 Operational Update.	8F88
>= 4.0	>= 4.0	0124	Future Dated Updated Security Credentials Alert ²	8F66, 8F67
>= 4.0	>= 4.0	0121	GBCS Use Case ECS101 Limit APC [n] Level Command processed	8F86
>= 4.0	>= 4.0	0122	GBCS Use Case ECS102 Limit APC [n] Level ended or cancelled	8F87
<u>>= 1.0</u>	<u>>= 4.1</u>	<u>012C</u>	<u>Firmware Distribution Receipt Alert (HCALCS)</u>	<u>8F72, 8F1C</u>

Table 1 Device Alert GBCS Message Codes

¹ Excluding Load Controller

² Load Controller only

³ GBCS 4.1 or later

Note on representation of Message Codes and Alert Codes in this document set: In GBCS, codes of this type, which are made up of 2 octets of data, are referred to in the format "0xnnnn", with the leading "0x" indicating that it is a hexadecimal number followed by 4 hexadecimal values, and that convention is also used in narrative text in this document set. However where showing how they would appear in XML samples they are shown using the XML representation, and since they use the "xs:hexBinary" XML type they will appear in the format "nnnn", i.e. without the leading "0x".

15.3.2 Device Alerts With No Additional Payload

Most Device Alerts consist of just an Alert Code without any substantial additional data. The Parse Output Format for these is described in Annex 18, section 18.4.3.

15.3.3 Device Alerts With Additional Payload

The Device Alerts which have additional payload are listed in the table below. These are either Alerts which have specific GBCS use cases associated with them, which are listed below, or Alerts sent as execution outcomes following Device Future Dated execution, for which there is information in the table below, and they are itemised in the table in [Table 19](#), section 15.4.4.5.

GBCS Version	Alert Code	Purpose	GBCS Use Case (where applicable)	Message Code	Section In This Document
>= 1.0	8F0A	Billing Data Log Updated (Electricity)	ECS68 ESME Critical Sensitive Alert (Billing Data Log)	0061	15.4.2
>= 1.0	8F0A	Billing Data Log Updated (Gas)	GCS53, GSME Push Billing Data Log as an Alert	008B	15.4.2

GBCS Version	Alert Code	Purpose	GBCS Use Case (where applicable)	Message Code	Section In This Document
>= 1.0 and modified in 4.1	8F1C	Firmware Verification Failed	CS05b	00CE (Firmware Distribution Receipt Alert (ESME/ HCALCS ³)), 00CF (Firmware Distribution Receipt Alert (GSME)) ¹ , <u>012C (Firmware Distribution Receipt Alert (HCALCS)³)</u>	15.4.1
>= 1.0	8F35 to 8F3C inclusive	Supply Outage Restored Alert	ECS80 Supply Outage Restore Alert from ESME	0067	15.4.3
>= 1.0 and modified in 4.0	8F66	Future-Dated Command Outcome Action Successful	Any GBCS Use Case that supports Device Future Dating	00CA (Future Dated Firmware Activation Alert), 00CB (Future Dated Updated Security Credentials Alert) ¹ , 00CC (Future Dated Execution Of Instruction Alert (DLMS COSEM)), 00CD (Future Dated Execution Of Instruction Alert (GBZ)), <i>GBCS v4.0 or later:</i> 0124 (Future Dated Update Load Controller Security Credentials Alert) ²	15.4.4
>= 1.0	8F67	Future-Dated Command Outcome Action Failed	Any GBCS Use Case that supports Device Future Dating	Same possibilities as for Alert Code 8F66	15.4.4
>= 1.0 and modified in 4.1	8F72	Firmware Verification Successful	CS05b	00CE (Firmware Distribution Receipt Alert (ESME/ HCALCS ³)), 00CF (Firmware Distribution Receipt Alert (GSME)) ¹ , <u>012C (Firmware Distribution Receipt Alert (HCALCS)³)</u>	15.4.1
>= 2.0	81A0	Smart Meter Integrity Issue – Warning	Smart Meter Integrity Issue – Warning from ESME or GSME	00F0 (Meter Integrity Issue Warning Alert – ESME) 00F2 (Meter Integrity Issue Warning Alert – GSME)	15.4.5

GBCS Version	Alert Code	Purpose	GBCS Use Case (where applicable)	Message Code	Section In This Document
>= 4.0	8F85	Sent by an ESME to indicate it has received a Command which it cannot support. This could happen for SAPCs since they are not required to implement all ESME commands	ECS100 Command not supported by Device.	0120	15.4.6
>= 4.0	8F88	Sent by a Device to indicate a change in operational status, e.g. an ESME has executed a change to an Auxiliary Controller's state	ECS200 Operational Update.	0123	15.4.7
>= 4.0	8F86	Sent by an ESME/ SAPC Device to indicate that the Device has processed a Limit APC Command	ECS101 Limit APC Level Command Processed	0x0121	15.4.8
>= 4.0	8F87	Sent by an ESME/ SAPC Device to indicate that an APC Limit Period has ended	ECS102 Limit APC Level Ended or Cancelled	0x0122	15.4.9

Table 2 Device Alert Codes with Additional Payload

¹ Excluding Load Controller

² Load Controller only

³ GBCS 4.1 or later

15.4 SMETS2 or later Payload Structures of Additional Alert Payload

This section provides details of additional payload in the Parse Output formats for SMETS2 or later Device Alerts. See section 15.5 for details of additional payload for SMETS1 Alerts, where applicable.

The Device Alert message structure described in Annex 18 section 18.4.3 includes an optional payload for the small number of Device Alerts which have additional payload above the Alert Code and header information. The "Payload" item described in section 18.4.3 has a choice of structures depending on the Alert Code, as shown in the following diagram.

Please note that the existing samples included in this section have not been updated to reflect the change in schemaVersion number.

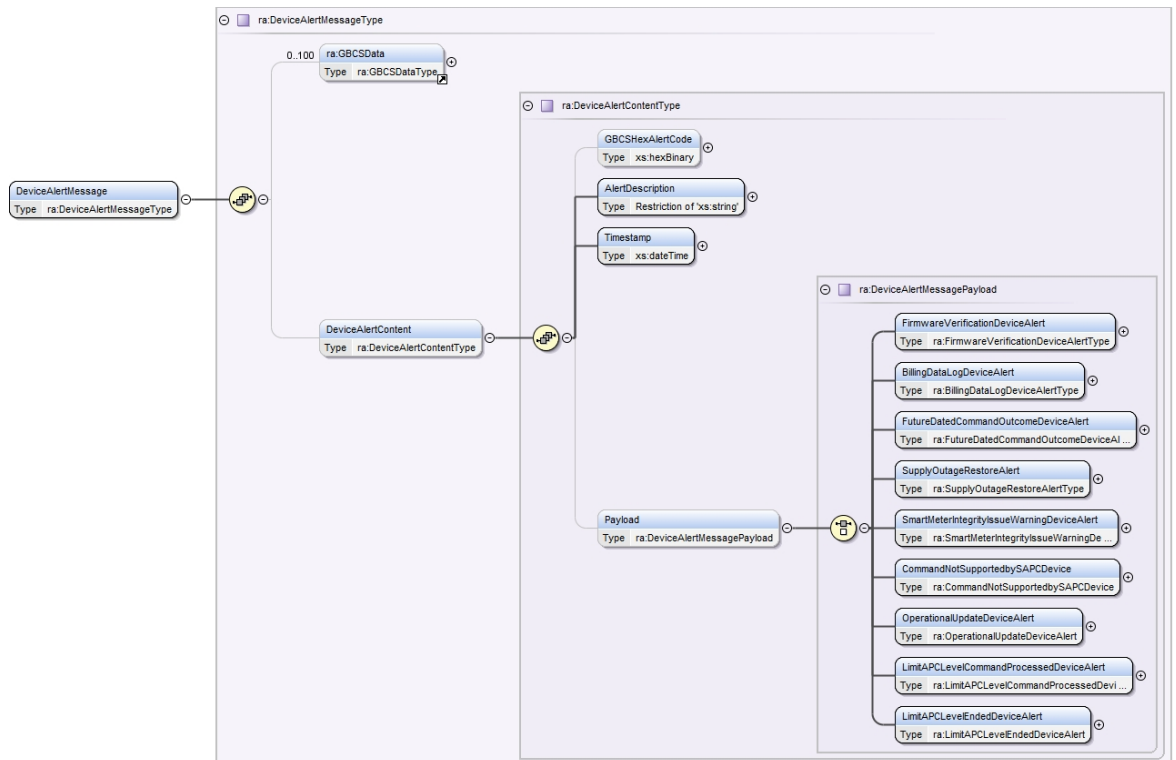


Figure 4 – Device Alert Additional Payload XML Structure

The individual types, dependent on the Alert Code, are described in the following sections.

XML samples in this annex are shown as full XML documents including the headers, even though in most annexes in this document set the headers are not shown. This is to illustrate the additional complexity introduced by the variation in Message Codes and GBCS Use Case references for Device Alerts.

15.4.1 Device Alert 0x8F1C and 0x8F72 Firmware Verification Status

These two Device Alerts returns the result of Firmware verification as part of the distribution of Firmware upgrades, as follows:

- Device Alert 0x8F1C indicates that it failed
- Device Alert 0x8F72 indicates that it was successful

The same additional payload is conveyed in each case.

See GBCS section 11.2.6 for more details. Note that this Alert type is also referred to in GBCS as “Firmware Distribution Receipt Alert”.

15.4.1.1 Format - FirmwareVerificationDeviceAlertType

The diagram shows the structure of FirmwareVerificationDeviceAlertType, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

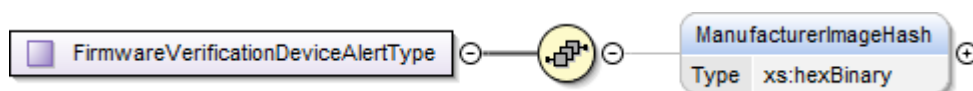


Figure 5 – Firmware Verification Device Alerts Parse Response Structure Detail

15.4.1.2 Specific Header Data Items

Data Item	Electricity Alert (ESME and HCALCS)	Gas Alert	Electricity Alert (HCALCS)
GBCSHexadecimalMessageCode	00CE	00CF	012C
GBCS Use Case Number (for information only - not in header)	N/A	N/A	N/A
GBCS Use Case Name (for information only - not in header)	Firmware Distribution Receipt Alert (ESME)	Firmware Distribution Receipt Alert (GSME)	Firmware Distribution Receipt Alert (HCALCS)
SupplementaryRemotePartyID	Not Present	Not Present	Not Present
SupplementaryRemotePartyCounter	Not Present	Not Present	Not Present
SupplementaryOriginatorCounter	Not Present	Not Present	Not Present
Timestamp	Not Present	Not Present	Not Present

Table 3 Firmware Verification Device Alerts Header Data

15.4.1.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F1C or 8F72	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Firmware verification failed, or Firmware verification succeeded	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	N/A	UTC Date-Time	Non-Sensitive
ManufacturerImageHash	Information associated with the firmware update. The Firmware hash as held in the CPL and presented in the format XX..XX (64 characters) where each X is one of the characters 0 to 9 or A to F. This data item should match the value on the CPL (excluding the colon separator between octet values) Note that a hexBinary value of length 32 is defined as 32 octets, an octet is represented by 2 characters.	xs:hexBinary (maxLength = 32)	N/A	N/A	Non-Sensitive

Table 4 Firmware Verification Device Alerts Parse Response Data Items

15.4.1.4 Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="1.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>00CE</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F1C</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Firmware verification failed</ra:AlertDescription>
        <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:FirmwareVerificationDeviceAlert>
            <ra:ManufacturerImageHash>0123456789ABCDEF0123456789ABCDEF0123456789ABCDEF0123456789ABCDEF
          </ra:ManufacturerImageHash>
          <ra:FirmwareVerificationDeviceAlert>
            <ra:Payload>
              <ra:DeviceAlertContent>
                <ra:DeviceAlertMessage>
                  <ra:Body>
                    </ra:GBCSResponse>
```

Figure 6 - Device Alert 0x8F1C Firmware Verification Failed Parse Response Sample

15.4.2 Device Alert 0x8F0A Billing Data Log Updated

This Device Alert returns the billing data log from a meter for one billing period only, triggered by reaching the end of a billing period.

The data is similar in structure to the data returned by Service Request 4.4.3 (see Annex section 4.4.3).

Note that two different GBCS use cases share the same Alert Code, but they are distinguished by having different Message Codes. This is shown in the following table.

GBCS Use Case	Message code	Alert Code
ECS68 ESME Critical Sensitive Alert (Billing Data Log)	0x0061	0x8F0A
GCS53, GSME Push Billing Data Log as an Alert	0x008B	0x8F0A

Table 5 Device Alert 0x8F0A Message Codes

Note that the billing data log is sensitive data, so is encrypted by the Device.

SMETS1: Although SMETS1 Devices do not generate these Device Alerts, there are SMETS1-specific comments in the payload descriptions in this section because the same XML elements are used to deliver responses to SRV 4.4.3.

15.4.2.1 Format - BillingDataLogDeviceAlertType

The diagram shows the structure of BillingDataLogDeviceAlert, which is the XML type used for this Alert in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

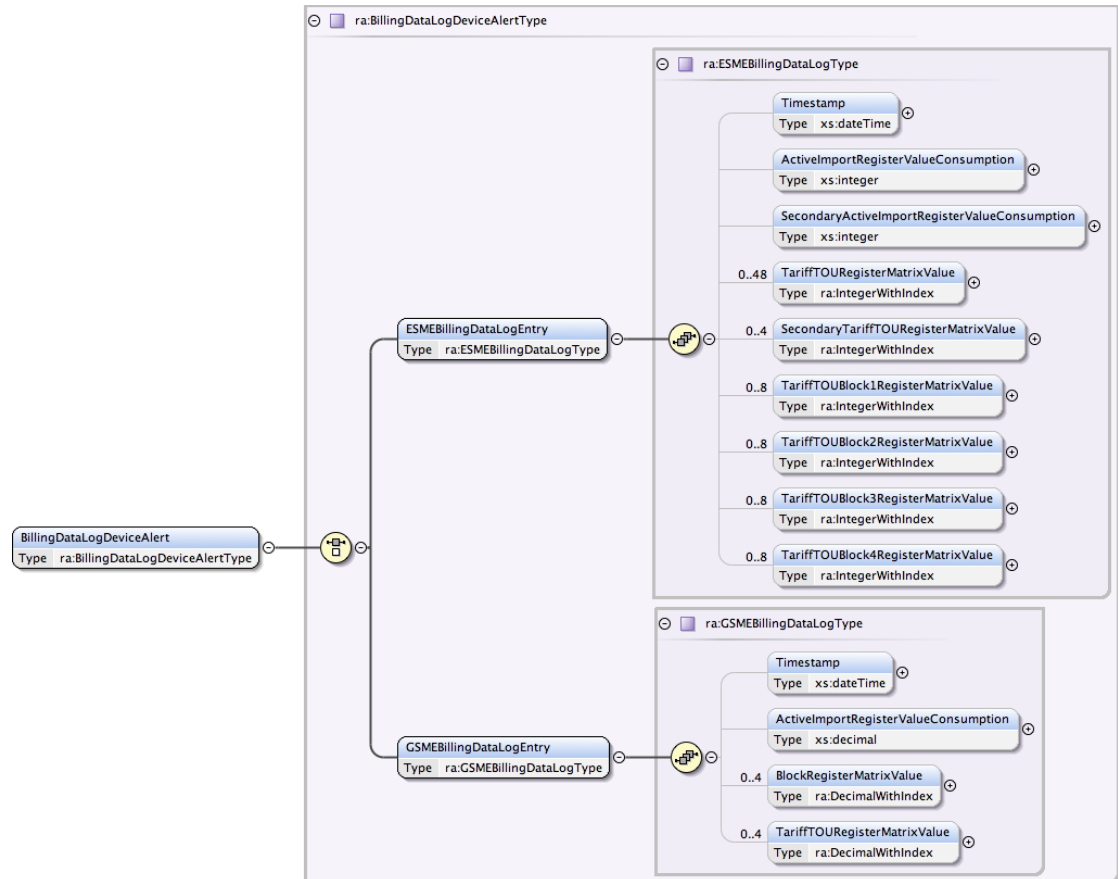


Figure 7 - Device Alert 0x8F0A Billing Data Log Updated Structure - Detail

15.4.2.2 Specific Header Data Items

Data Item	Electricity Alert	Gas Alert
GBCSHexadecimalMessageCode	0061	008B
<i>GBCS Use Case Number (for information only - not in header)</i>	<i>ECS68</i>	<i>GCS53</i>
<i>GBCS Use Case Name (for information only - not in header)</i>	<i>ESME Push Billing Data Log as an Alert</i>	<i>GSME Push Billing Data Log as an Alert</i>
SupplementaryRemotePartyID	Not Present	Not Present
SupplementaryRemotePartyCounter	Not Present	Not Present
SupplementaryOriginatorCounter	Not Present	Not Present
Timestamp	Present	Present

Table 6 Device Alert 0x8F0A Billing Data Log Updated Header Data

15.4.2.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F0A	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	ESME Push Billing Data Log as an Alert GSME Push Billing Data Log as an Alert	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	Yes	UTC Date-Time	Non-Sensitive
ESMEBillingDataLogEntry	Electricity Smart Meter Billing Data Log Entry	ra:ESMEBillingDataLogType (see section 15.4.2.4)	N/A	N/A	Sensitive
GSMEBillingDataLogEntry	Gas Smart Meter Billing Data Log Entry	ra:GSMEBillingDataLogType (see section 15.4.2.5)	N/A	N/A	Sensitive

Table 7 Device Alert 0x8F0A Billing Data Log Updated Data Items

15.4.2.4 ESMEBillingDataLogType Data Items

SMETS1: This definition is applicable to SMETS1 only where it is used in responses to Service Requests, since Billing Data Log Updated information is not supported as Alerts for SMETS1 Devices.

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
Timestamp	Date and time when the end of billing period snapshot was taken	xs:dateTime	None	UTC Date-Time	Sensitive
ActiveImportRegisterValueConsumption	Register that records the Primary Element cumulative Active Energy Imported SMETS1: Where the Device is not capable of recording this value, the DCC shall set the value to the relevant Unsupported Value (see section 19.9) to indicate that the Device does not support that parameter.	xs:integer	None	Wh	Sensitive
SecondaryActiveImportRegisterValueConsumption	Register that records the Secondary Element cumulative Active Energy Imported. Optional, as only applicable to Electricity Smart Meters with a Secondary Element.	xs:integer	None	Wh	Sensitive
TariffTOURegisterMatrixValue ¹	Each of the values in the 1 x 48 matrix for storing Primary Element Tariff Registers for Time-of-use Pricing	ra:IntegerWithIndex	None	Wh	Sensitive
SecondaryTariffTOURegisterMatrixValue ²	Each of the values in the 1 x 4 matrix for storing Secondary Element Tariff Registers for Time-of-use Pricing. Optional, as only applicable to Electricity Smart Meters with a Secondary Element.	ra:IntegerWithIndex	None	Wh	Sensitive

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
TariffTOUBlock1RegisterMatrixValue ³	Each of the values in the first row of the 4 x 8 matrix for storing Tariff Registers for Time-of-use with Block Pricing SMETS1: This value shall be populated by Tariff Block Counter Matrix values from the SMETS1 Device's Billing Data Log.	ra:IntegerWithIndex	None	Wh	Sensitive
TariffTOUBlock2RegisterMatrixValue ³	Each of the values in the second row of the 4 x 8 matrix for storing Tariff Registers for Time-of-use with Block Pricing SMETS1: This value shall be populated by Tariff Block Counter Matrix values from the SMETS1 Device's Billing Data Log.	ra:IntegerWithIndex	None	Wh	Sensitive
TariffTOUBlock3RegisterMatrixValue ³	Each of the values in the third row of the 4 x 8 matrix for storing Tariff Registers for Time-of-use with Block Pricing SMETS1: This value shall be populated by Tariff Block Counter Matrix values from the SMETS1 Device's Billing Data Log.	ra:IntegerWithIndex	None	Wh	Sensitive
TariffTOUBlock4RegisterMatrixValue ³	Each of the values in the fourth row of the 4 x 8 matrix for storing Tariff Registers for Time-of-use with Block Pricing SMETS1: This value shall be populated by Tariff Block Counter Matrix values from the SMETS1 Device's Billing Data Log.	ra:IntegerWithIndex	None	Wh	Sensitive

Table 8 Device Alert 0x8F0A Billing Data Log Updated - ESMEBillingDataLogType Data Items

¹ Minimum 0, maximum 48

² Minimum 0, maximum 4

³ Minimum 0, maximum 8

15.4.2.5 GSMEBillingDataLogType Data Items

SMETS1: This definition is applicable to SMETS1 only where it is used in responses to Service Requests, since Billing Data Log Updated information is not supported as Alerts for SMETS1 Devices.

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
ActiveImportRegisterValueConsumption	Register that records the Primary Element cumulative Active Energy Imported Multiplier (value of 1) and divisor (value of 1000) applied as defined in GBCS SMETS1: Where the Device is not capable of recording this value, the DCC shall set the value to the relevant Unsupported Value (see section 19.9) to indicate that the Device does not support that parameter.	xs:decimal	None	m ³	Sensitive
BlockRegisterMatrixValue ¹	Each of the values in the 1 x 4 matrix for storing Tariff Registers for Time-of-use with Block Pricing Multiplier (value of 1) and divisor (value of 1000) applied as defined in GBCS	ra:DecimalWithIndex	None	m ³	Sensitive
TariffTOURegisterMatrixValue ¹	Each of the values in the A 1 x 4 matrix for storing Tariff Registers for Time-of-use Pricing Multiplier (value of 1) and divisor (value of 1000) applied as defined in GBCS	ra:DecimalWithIndex	None	m ³	Sensitive
Timestamp	Date and time when the end of billing period snapshot was taken	xs:dateTime	None	UTC Date-Time	Sensitive

Table 9 Device Alert 0x8F0A Billing Data Log Updated - GSMEBillingDataLogType Data Items

¹ Minimum 0, maximum 4

15.4.2.6 Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="1.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>0061</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F0A</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Billing Data Log Updated</ra:AlertDescription>
        <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:BillingDataLogDeviceAlert>
            <ra:ESMEBillingDataLogEntry>
              <ra:Timestamp>2014-05-04T18:12:51.00</ra:Timestamp>
              <ra:ActiveImportRegisterValueConsumption>2345</ra:ActiveImportRegisterValueConsumption>
              <ra:TariffTOURegisterMatrixValue index="1">20123</ra:TariffTOURegisterMatrixValue>
              <ra:TariffTOURegisterMatrixValue index="2">10456</ra:TariffTOURegisterMatrixValue>
              <ra:TariffTOUBlock1RegisterMatrixValue index="1">5678</ra:TariffTOUBlock1RegisterMatrixValue>
            </ra:ESMEBillingDataLogEntry>
          </ra:BillingDataLogDeviceAlert>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 8 - Device Alert 0x8F0A Billing Data Log Updated Parse Response Sample (Electricity)

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="1.0">
  <ra:Header>
    <ra:BusinessOriginatorID>30-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>008B</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F0A</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Billing Data Log Updated</ra:AlertDescription>
        <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:BillingDataLogDeviceAlert>
            <ra:GSMEBillingDataLogEntry>
              <ra:Timestamp>2014-05-04T18:12:51.00</ra:Timestamp>
              <ra:ActiveImportRegisterValueConsumption>2.345</ra:ActiveImportRegisterValueConsumption>
              <ra:BlockRegisterMatrixValue index="1">20.123</ra:BlockRegisterMatrixValue>
              <ra:TariffTOURegisterMatrixValue index="2">10.456</ra:TariffTOURegisterMatrixValue>
            </ra:GSMEBillingDataLogEntry>
          </ra:BillingDataLogDeviceAlert>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 9 - Device Alert 0x8F0A Billing Data Log Updated Parse Response Sample (Gas)

15.4.3 Supply Outage Restored Device Alerts

These Alerts are sent after the restoration of supply to an Electricity Smart Meter. They have slightly different meanings, as in the following table.

Alert Code	Purpose According to GBCS
0x8F35	Supply Outage Restored
0x8F36	Supply Outage Restored - Outage >= 3 minutes
0x8F37	Supply Outage Restored on Phase 1
0x8F38	Supply Outage Restored on Phase 1 Restored - Outage >= 3 minutes
0x8F39	Supply Outage Restored on Phase 2 Restored
0x8F3A	Supply Outage Restored on Phase 2 Restored - Outage >= 3 minutes
0x8F3B	Supply Outage Restored on Phase 3 Restored
0x8F3C	Supply Outage Restored on Phase 3 Restored - Outage >= 3 minutes

Table 10 Supply Outage Restored Alert Purposes

15.4.3.1 Format - SupplyOutageRestoreAlertType

The diagram shows the structure of SupplyOutageRestoreAlert, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

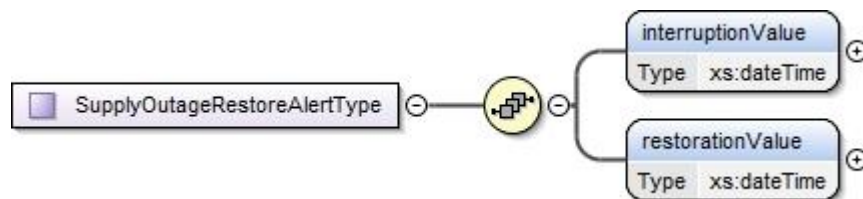


Figure 10 - Supply Outage Restored Alert Parse Response Structure - Detail

15.4.3.2 Specific Header Data Items

Data Item	Electricity Alert
GBCSHexadecimalMessageCode	0067
<i>GBCS Use Case Number (for information only - not in header)</i>	<i>ECS80</i>
<i>GBCS Use Case Name (for information only - not in header)</i>	<i>Supply Outage Restore Alert from ESME</i>
SupplementaryRemotePartyID	Not Present
SupplementaryRemotePartyCounter	Not Present
SupplementaryOriginatorCounter	Not Present
Timestamp	Not Present

Table 11 Supply Outage Restored Alert Header Data Items

15.4.3.3 Specific Body Data Items

All of the 4 Device Alerts above carry the same type of payload, as in the following table.

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F35 to 8F3C	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Supply Outage Restored Supply Outage Restored - Outage >= 3 minutes Supply Outage Restored on Phase 1 Supply Outage Restored on Phase 1 Restored - Outage >= 3 minutes Supply Outage Restored on Phase 2 Restored Supply Outage Restored on Phase 2 Restored - Outage >= 3 minutes Supply Outage Restored on Phase 3 Restored Supply Outage Restored on Phase 3 Restored - Outage >= 3 minutes	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	Yes	UTC Date-Time	Non-Sensitive
interruptionValue	The date-time at which power was interrupted	xs:dateTime	None	UTC Date-Time	Non-Sensitive
restorationValue	The date-time at which power was restored	xs:dateTime	None	UTC Date-Time	Non-Sensitive

Table 12 Supply Outage Restored Alert Data Items

15.4.3.4 Sample Response

This XML sample is for Device Alert 0x8F37, which means supply has been restored to phase 1 of a 3 phase Electricity Smart Meter.

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="1.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>0067</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F37</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Supply Outage Restored on Phase 1</ra:AlertDescription>
        <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:SupplyOutageRestoreAlert>
            <ra:interruptionValue>2014-05-04T17:13:51.0</ra:interruptionValue>
            <ra:restorationValue>2014-05-04T18:14:51.0</ra:restorationValue>
          </ra:SupplyOutageRestoreAlert>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 11 - Device Alert 0x8F37 Supply Outage Restored on Phase 1

15.4.4 Device Alert 0x8F66 and 0x8F67 Future Dated Command Outcome

These Device Alerts return the result of all or part of a Device future-dated command, which may be:

- Device Alert 0x8F66, indicating that it was successful
- Device Alert 0x8F67, indicating that it failed

These apply to Device Future Dated commands, i.e. those where the "Future Dated" column in the Service Request Matrix in the DUGIDS main document section 9.4 is set to "Device". The XML type of the payload is the same for both 0x8F66 and 0x8F67.

It is necessary for the XML structures carrying these Alerts to vary according to the underlying GBCS protocol used, because where the underlying GBCS protocol is DLMS/COSEM or GBZ (ZigBee) one Alert will be generated for each protocol-specific instruction within the corresponding command, so it is necessary to convey protocol-specific information to distinguish them.

As a GBCS command can contain multiple individual instructions within the same GBCS command, there may be multiple Alerts following the execution of a Device Future Dated Service Request. These will be sent to Service Users as separate Device Alerts by the DSP.

It is possible for an instruction to fail after earlier instructions have completed successfully, so there may be a mixture of 0x8F66 Alerts and 0x8F67 Alerts corresponding to different parts of the same Future Dated Service Request.

Devices will follow Break On Error processing, meaning that if an instruction fails no more instructions will be processed, however in these cases a Device Alert will be sent for each non-executed instruction as well, to show the status. The communications networks will not be able to guarantee that Alerts arrive at the DSP in the order they were sent, so although Alerts indicating success will not be generated by the Device after a failure within the same command, it is possible they will be received by a Service User in the reverse order.

The number of these Alerts which will be received for each Future Dated Service Request, which in some cases can vary depending on the data in the Service Request, is specified in the Annex sections covering individual Service Requests.

The Service Response wrapper contains additional information to indicate which instruction the Alert relates to, and how many are expected for that Command in total, though there will be no indication of that in the XML produced by Parse software from the GBCS payload of the Alert, since that information is not part of the GBCS payload.

The overall pattern of Responses and Alerts for Future Dated Service Requests is described in the main document section 9.3.6.

See GBCS section 9.2.2.6 for more information.

15.4.4.1 Format - FutureDatedCommandOutcomeDeviceAlertType

The diagram shows the structure of FutureDatedCommandOutcomeDeviceAlertType, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

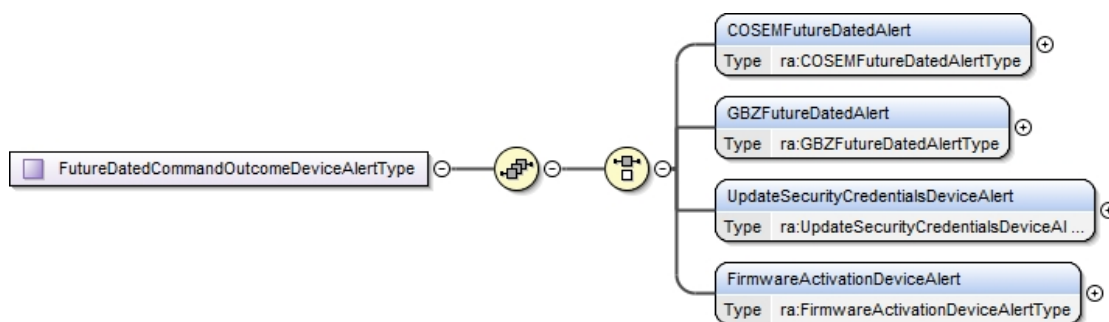


Figure 12 – Device Alert Future-Dated Command Outcome Parse Response Structure – High Level

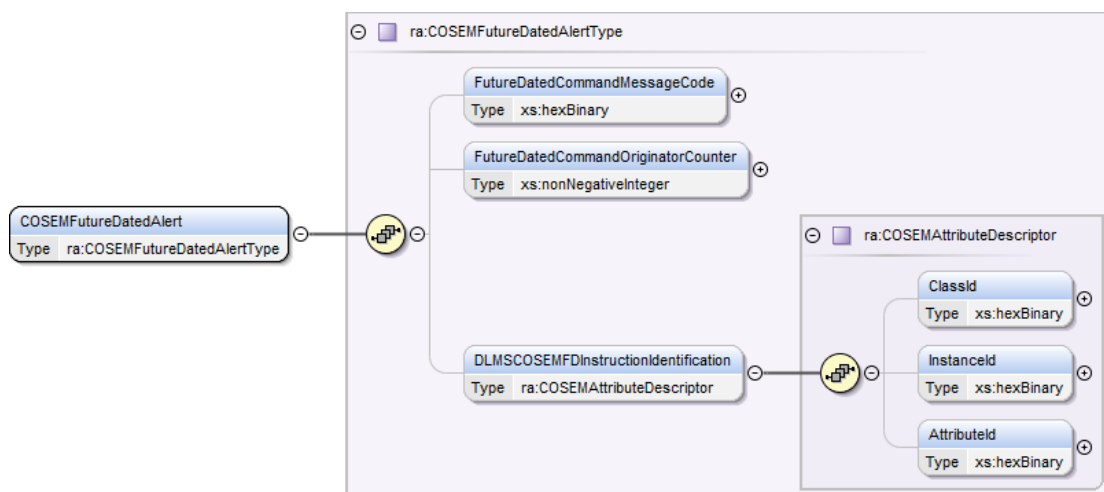


Figure 13 – DLMS/COSEM Future Dated Command Outcome Alert Structure

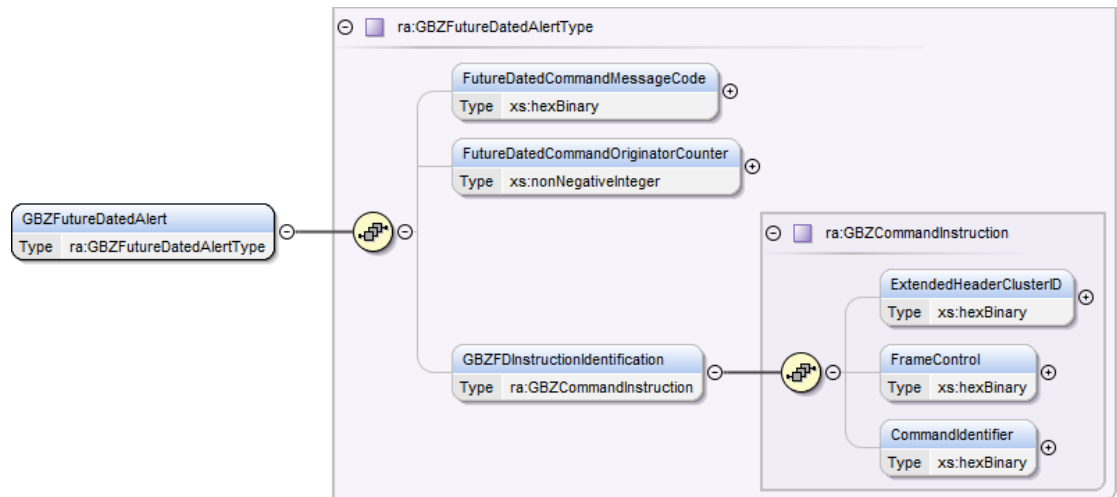


Figure 14 – GBZ (ZigBee) Future Dated Command Outcome Alert Structure

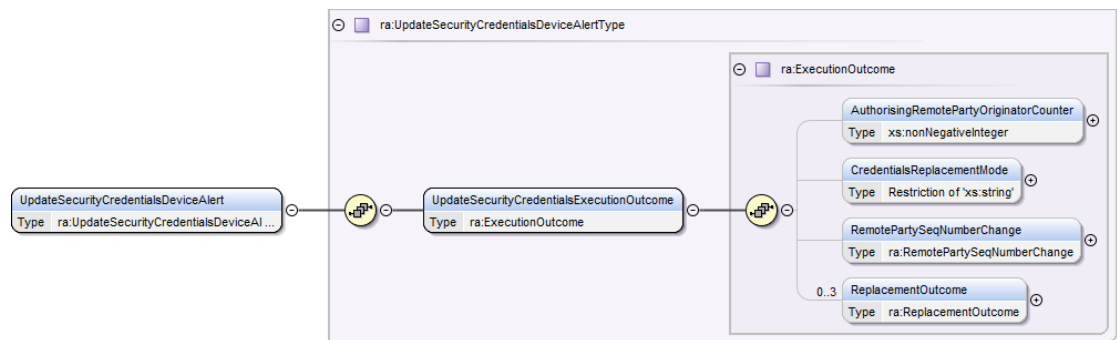


Figure 15 – Update Security Credentials Future Dated Command Alert Structure

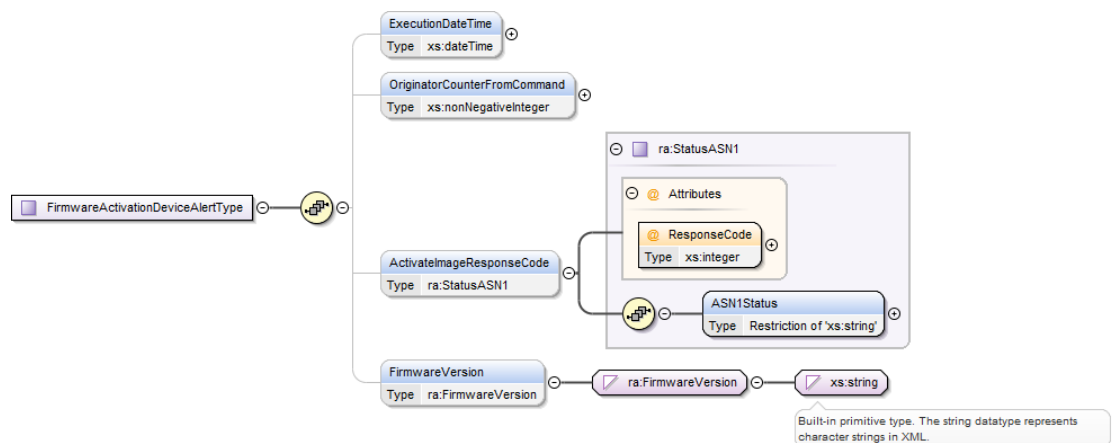


Figure 16 – Firmware Activation Future Dated Command Alert Structure

15.4.4.2 Specific Header Data Items

Data Item	Electricity Alert	Gas Alert
GBCSHexadecimalMessageCode	00CA (Future Dated Firmware Activation Alert), 00CB (Future Dated Updated Security Credentials Alert), 00CC (Future Dated Execution Of Instruction Alert (DLMS COSEM)) GBCS v4.0 or later: 0124 (Future Dated Update Load Controller Security Credentials Alert)	00CA (Future Dated Firmware Activation Alert), 00CB (Future Dated Updated Security Credentials Alert), 00CD (Future Dated Execution Of Instruction Alert (GBZ))
GBCS Use Case Number (for information only - not in header)	N/A	N/A
GBCS Use Case Name (for information only - not in header)	N/A	N/A
SupplementaryRemotePartyID	Not Present	Not Present
SupplementaryRemotePartyCounter	Not Present	Not Present
SupplementaryOriginatorCounter	Not Present	Not Present
Timestamp	Not Present	Not Present

Table 13 Device Alert Future-Dated Command Outcome Header Data

15.4.4.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F66 or 8F67	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Future-Dated Command Action Successful Future-Dated Command Action Failed	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	Yes	UTC Date-Time	Non-Sensitive
COSEMFutureDatedAlert	Alert payload for an Alert where underlying GBCS protocol is DLMS/COSEM. Present only for Alerts relating to DLMS/COSEM commands.	ra:COSEMFutureDatedAlertType (see section 15.4.4.3.1)	N/A	N/A	Non-Sensitive

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBZFutureDatedAlert	Alert payload for an Alert where underlying GBCS protocol is GBZ. Present only for Alerts relating to GBZ (ZigBee Smart Energy) commands.	ra: GBZFutureDatedAlertType (see section 15.4.4.3.2)	N/A	N/A	Non-Sensitive
UpdateSecurityCredentialsDeviceAlert	Alert payload for the outcome of a Future Dated Update Security Credentials request. Present only for Alerts relating to Future Dated Update Security Credentials requests.	ra: UpdateSecurityCredentialsDeviceAlertType (see section 15.4.4.3.3)	N/A	N/A	Non-Sensitive
FirmwareActivationDeviceAlert	Alert payload for the outcome of a Future Dated Firmware Activation request. Present only for Alerts relating to Future Dated Firmware Activation requests.	ra: FirmwareActivationDeviceAlertType (see section 15.4.4.3.4)	N/A	N/A	Non-Sensitive

Table 14 Device Alert Future-Dated Command Outcome Data Items

15.4.4.3.1 COSEMFutureDatedAlertType Data Items

This is returned only for Alerts where the underlying GBCS protocol of the corresponding Future Dated command was DLMS/COSEM.

It identifies the instruction to which the Alert relates, which could be one of multiple instructions in the command. Each Alert of this type relates only to one instruction.

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
FutureDatedCommandMessageCode	The message code of the future-dated command for which this is the Device Alert conveying the outcome.	xs:hexBinary	N/A	N/A	Non-sensitive
FutureDatedCommandOriginatorCounter	The originator counter from the future-dated command for which this is the Device Alert conveying the outcome.	xs:nonNegativeInteger	N/A	N/A	Non-sensitive
ClassId	DLMS/COSEM class ID	xs:hexBinary	N/A	N/A	Non-Sensitive
InstanceId	DLMS/COSEM instance ID (OBIS code)	xs:hexBinary	N/A	N/A	Non-Sensitive
AttributeId	DLMS/COSEM attribute ID	xs:hexBinary	N/A	N/A	Non-Sensitive

Table 15 DLMS/COSEM Future Dated Command Outcome Alert Structure Data Items

15.4.4.3.2 GBZFutureDatedAlertType Data Items

This is returned only for Alerts where the underlying GBCS protocol of the corresponding Future Dated command was GBZ (ZigBee Smart Energy).

It identifies the instruction to which the Alert relates, which could be one of multiple instructions in the command. Each Alert of this type relates only to one instruction.

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
FutureDatedCommandMessageCode	The message code of the future-dated command for which this is the Device Alert conveying the outcome.	xs:hexBinary	N/A	N/A	Non-sensitive
FutureDatedCommandOriginatorCounter	The originator counter from the future-dated command for which this is the Device Alert conveying the outcome.	xs:nonNegativeInteger	N/A	N/A	Non-sensitive
ExtendedHeaderClusterID	ZigBee Smart Energy Cluster ID	xs:hexBinary	N/A	N/A	Non-Sensitive
FrameControl	ZigBee Smart Energy Frame Control identifier	xs:hexBinary	N/A	N/A	Non-Sensitive
CommandIdentifier	ZigBee Smart Energy Command ID	xs:hexBinary	N/A	N/A	Non-Sensitive

Table 16 GBZ Future Dated Command Outcome Alert Structure Data Items

15.4.4.3.3 UpdateSecurityCredentialsDeviceAlert Data Items

This is returned only for Alerts relating to Future Dated Update Security Credentials requests.

The detail of the Alert is carried in the XML type ExecutionOutcome. For full details of the data contained within this data type, see Annex 6, section 6.15.1.2.2, "ExecutionOutcome Data Items".

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
UpdateSecurityCredentialsExecutionOutcome	Type defined for response to update security credentials use case. See Annex 6 section 6.15.1.2.3, "ExecutionOutcome Data Items", for details of this XML type.	ra:ExecutionOutcome (see section 6.15.1.2.3)	N/A	N/A	Non-sensitive

Table 17 Update Security Credentials Future Dated Command Alert Data Items

15.4.4.3.4 FirmwareActivationDeviceAlert Data Items

This is returned only for Alerts relating to Future Dated Firmware Activation requests.

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
ExecutionDateTime	The date & time of the execution of the command to activate firmware on the Device, in UTC time.	xs:dateTime	N/A	UTC Date-Time	Non-Sensitive
OriginatorCounterFromCommand	Originator counter in the command which requested activation of firmware.	xs:nonNegativeInteger	N/A	N/A	Non-sensitive

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
ActivateImageResponseCode	Outcome of the request for each replacement. Valid Set: <ul style="list-style-type: none"> success noImageHeld hashMismatch activationFailure 	Restriction base xs:string (Enumeration)	None	N/A	Non-Sensitive
FirmwareVersion	A unique identifier representing a firmware image that has been approved for release by the DCC User concerned. The Firmware version as held in the CPL and presented in the format XXXXXXXX where each X is one of the characters 0 to 9 or A to F. This data item should match the value on the CPL (excluding the colon separator between octet values)	ra:FirmwareVersion (restriction of xs:string, maxLength = 8)	None	N/A	Non-Sensitive

Table 18 Firmware Activation Future Dated Command Alert Data Items

15.4.4.4 Sample Response

The following example shows an Alert for a Future Dated command where the underlying protocol is DLMS/COSEM and for which the instruction was successful.

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="1.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>150</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>00CC</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F66</ra:GBCSHexAlertCode>
        <ra:AlertDescription> Future Dated Command Successful Device Alert</ra:AlertDescription>
        <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:FutureDatedCommandOutcomeDeviceAlert>
            <ra:COSEMFutureDatedAlert>
              <ra:FutureDatedCommandMessageCode>00B7</ra:FutureDatedCommandMessageCode>
              <ra:FutureDatedCommandOriginatorCounter>130</ra:FutureDatedCommandOriginatorCounter>
              <ra:DLMSCOSEMFDInstructionIdentification>
                <ra:ClassId>0014</ra:ClassId>
                <ra:InstanceId>00000D0001FF</ra:InstanceId>
                <ra:AttributeId>09</ra:AttributeId>
              </ra:DLMSCOSEMFDInstructionIdentification>
            </ra:COSEMFutureDatedAlert>
          </ra:FutureDatedCommandOutcomeDeviceAlert>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 17 Device Alert 0x8F66 Future-Dated Command Successful DLMS/COSEM Instruction Parse Response Sample

The following example shows an Alert for a Future Dated command where the underlying protocol is GBZ (ZigBee) and for which the instruction was successful.

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="1.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>150</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>00CD</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F66</ra:GBCSHexAlertCode>
        <ra:AlertDescription> Future Dated Command Successful Device Alert</ra:AlertDescription>
        <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:FutureDatedCommandOutcomeDeviceAlert>
            <ra:GBZFutureDatedAlert>
              <ra:FutureDatedCommandMessageCode>006B</ra:FutureDatedCommandMessageCode>
              <ra:FutureDatedCommandOriginatorCounter>130</ra:FutureDatedCommandOriginatorCounter>
              <ra:GBZFDInstructionIdentification>
                <ra:ExtendedHeaderClusterID>0707</ra:ExtendedHeaderClusterID>
                <ra:FrameControl>01</ra:FrameControl>
                <ra:CommandIdentifier>02</ra:CommandIdentifier>
              </ra:GBZFDInstructionIdentification>
            </ra:GBZFutureDatedAlert>
          </ra:FutureDatedCommandOutcomeDeviceAlert>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 18 Device Alert 0x8F66 Future-Dated Command Successful GBZ Instruction Parse Response Sample

The following example shows an Alert for a Future Dated Firmware Activation request for which the outcome was successful.

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="1.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>00CA </ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F66</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Update Security Credentials Device Alert</ra:AlertDescription>
        <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:FutureDatedCommandOutcomeDeviceAlert >
            <ra:FirmwareActivationDeviceAlert>
              <ra:ExecutionDateTime>2014-05-04T18:13:41.00</ra:ExecutionDateTime>
              <ra:OriginatorCounterFromCommand>12345</ra:OriginatorCounterFromCommand>
              <ra:ActivateImageResponseCode ResponseCode="0">
                <ra:ASN1Status>success</ra:ASN1Status>
              </ra:ActivateImageResponseCode>
              <ra:FirmwareVersion>1100EEFF</ra:FirmwareVersion>
            </ra:FirmwareActivationDeviceAlert>
          </ra:FutureDatedCommandOutcomeDeviceAlert >
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 19 Device Alert 0x8F66 Future-Dated Firmware Activation Parse Response Sample

The following example shows an Alert for a Future Dated Update Security Credentials request for which the outcome was unsuccessful.

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="1.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>00CB</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F67</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Update Security Credentials Device Alert</ra:AlertDescription>
        <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:FutureDatedCommandOutcomeDeviceAlert >
            <ra:UpdateSecurityCredentialsDeviceAlert>
              <ra:UpdateSecurityCredentialsExecutionOutcome>
                <ra:AuthorisingRemotePartyOriginatorCounter>50</ra:AuthorisingRemotePartyOriginatorCounter>
                <ra:CredentialsReplacementMode>SupplierBySupplier</ra:CredentialsReplacementMode>
                <ra:RemotePartySeqNumberChange>
                  <ra:RemotePartyRole>Supplier</ra:RemotePartyRole>
                  <ra:RemotePartyFloorSeqNumber>50</ra:RemotePartyFloorSeqNumber>
                </ra:RemotePartySeqNumberChange>
                <ra:ReplacementOutcome>
                  <ra:StatusCode ResponseCode="0">
                    <ra:ASN1Status>success</ra:ASN1Status>
                  </ra:StatusCode>
                  <ra:CertificateType>DigitalSigning</ra:CertificateType>
                  <ra:RemotePartyRole>Supplier</ra:RemotePartyRole>
                  <ra:ExistingRemotePartyID>00-00-00-00-00-00-00-00</ra:ExistingRemotePartyID>
                  <ra:ExistingCertificateHash>ZGVmYXVsdA==</ra:ExistingCertificateHash>
                </ra:ReplacementOutcome>
                <ra:ReplacementOutcome>
                  <ra:StatusCode ResponseCode="5">
                    <ra:ASN1Status>badCertificate</ra:ASN1Status>
                  </ra:StatusCode>
                  <ra:CertificateType>DigitalSigning</ra:CertificateType>
                  <ra:RemotePartyRole>Supplier</ra:RemotePartyRole>
                  <ra:ExistingRemotePartyID>00-00-00-00-00-00-00-00</ra:ExistingRemotePartyID>
                  <ra:ExistingCertificateHash>ZGVmYXVsdA==</ra:ExistingCertificateHash>
                </ra:ReplacementOutcome>
              </ra:UpdateSecurityCredentialsExecutionOutcome>
            </ra:UpdateSecurityCredentialsDeviceAlert>
          </ra:FutureDatedCommandOutcomeDeviceAlert >
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 20 Device Alert 0x8F67 Future-Dated Update Security Credentials Parse Response Sample

15.4.4.5 Summary of Device Alert Payloads in Device Future Dated Service Requests

As described above, the payload of Device Alerts 0x8F66 and 0x8F67 is variable according to the Service Request type and input data. The following table summarises the expected number of Alerts for each Future Dated Service Request. Note that the number of Alerts is fixed in the majority of cases, with the exception of Service Request 1.1.1 for the GSME, in this instance the number of Alerts varies depending on whether it is a block Tariff or TOU Tariff.

Service Request	Device Alerts Payload Data Type - Electricity	Number of Device Alerts – Electricity	Device Alerts Payload Data Type - Gas	Number of Device Alerts – Gas
1.1.1	COSEMFutureDatedAlert <ul style="list-style-type: none"> TariffSwitchingTable TariffSwitchingTable(SpecialDays) TariffThresholdMatrix CurrencyUnit StandingCharge TariffBlockPriceMatrixTOU 	6	GBZFutureDatedAlert <ul style="list-style-type: none"> TariffThresholdMatrix (optional) TariffSwitchingTable TariffSwitchingTable (SpecialDays) TariffBlockPriceMatrixTOU StandingCharge 	4 to 5
1.1.2	COSEMFutureDatedAlert <ul style="list-style-type: none"> TariffSwitchingTable(SecondaryElement) TariffSwitchingTable(SecondaryElement)(SpecialDays) SecondaryTariffTOUPriceMatrix 	3	N/A	N/A
1.2.1	COSEMFutureDatedAlert <ul style="list-style-type: none"> StandingCharge TariffBlockPriceMatrixTOU 	2	GBZFutureDatedAlert <ul style="list-style-type: none"> StandingCharge TariffBlockPriceMatrixTOU 	2
1.2.2	COSEMFutureDatedAlert	1	N/A	N/A
1.6	COSEMFutureDatedAlert Credit <ul style="list-style-type: none"> SuspendDebtDisabled / SuspendDebtEmergency / Payment Mode Prepayment <ul style="list-style-type: none"> SuspendDebtDisabled / SuspendDebtEmergency / Payment Mode DisablementThreshold(MeterBalance) 	1 (credit), 2 (pre-payment)	GBZFutureDatedAlert	1
2.1	COSEMFutureDatedAlert <ul style="list-style-type: none"> Non-DisablementCalendar DebtRecoveryRateCap(amount) DebtRecoveryRateCap(period) EmergencyCreditLimit EmergencyCreditThreshold LowCreditThreshold PrepaymentCredit(MaximumCreditThreshold) PrepaymentCredit(MaxMeterBalance) Non-DisablementCalendar(SpecialDays) 	9	GBZFutureDatedAlert <ul style="list-style-type: none"> EmergencyCreditLimit LowCreditThreshold Non-DisablementCalendar Non-DisablementCalendar(SpecialDays) PrepaymentCredit(MaximumCreditThreshold) DebtRecoveryRateCap 	6
6.4.1	COSEMFutureDatedAlert <ul style="list-style-type: none"> LoadLimitPeriod(Timer) LoadLimitPowerThreshold LoadLimitRestorationPeriod(Timer) LoadLimitSupplyState 	4	N/A	N/A

Service Request	Device Alerts Payload Data Type - Electricity	Number of Device Alerts – Electricity	Device Alerts Payload Data Type - Gas	Number of Device Alerts – Gas
6.14.2	COSEMFutureDatedAlert <ul style="list-style-type: none"> AuxiliaryLoadControlSwitchesCalendar AuxiliaryLoadControlSwitchesCalendar(SpecialDays) 	2	N/A	N/A
6.14.3	COSEMFutureDatedAlert <ul style="list-style-type: none"> AuxiliaryControllerCalendar AuxiliaryControllerCalendar(SpecialDays) 	2	N/A	N/A
6.15.1	UpdateSecurityCredentialsDeviceAlert	1	UpdateSecurityCredentialsDeviceAlert	1
6.23	UpdateSecurityCredentialsDeviceAlert	1	UpdateSecurityCredentialsDeviceAlert	1
11.3	FirmwareActivationDeviceAlert	1	FirmwareActivationDeviceAlert	1

Table 19 Future Dated Device Alert Payload Data Types

15.4.5 Device Alert 0x81A0 Smart Meter Integrity Issue – Warning

This Device Alert (new in GBCS v2.0) returns a warning indicating potential integrity issue reason.

See GBCS section 16.4 for more details.

15.4.5.1 Format - SmartMeterIntegrityIssueWarningDeviceAlertType

The diagram shows the structure of SmartMeterIntegrityIssueWarningDeviceAlertType, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

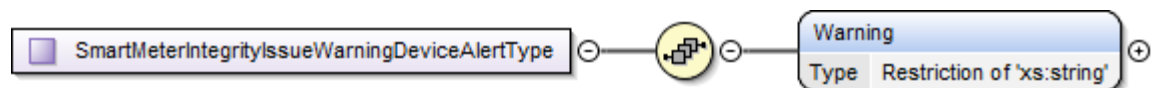


Figure 21 – Smart Meter Integrity Issue - Warning Device Alerts Parse Response Structure Detail

15.4.5.2 Specific Header Data Items

GBCS v2.0:

Data Item	Electricity Alert	Gas Alert
GBCSHexadecimalMessageCode	00F0	00F2
<i>GBCS Use Case Number (for information only - not in header)</i>	N/A	N/A

Data Item	Electricity Alert	Gas Alert
<i>GBCS Use Case Name (for information only - not in header)</i>	<i>Meter Integrity Issue Warning Alert - ESME</i>	<i>Meter Integrity Issue Warning Alert - GSME</i>
SupplementaryRemotePartyID	Not Present	Not Present
SupplementaryRemotePartyCounter	Not Present	Not Present
SupplementaryOriginatorCounter	Not Present	Not Present
Timestamp	Not Present	Not Present

Table 20 Smart Meter Integrity Issue - Warning Device Alerts Header Data – GBCS v2.0

15.4.5.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	81A0	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Smart Meter Integrity Issue – Warning	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	N/A	UTC Date-Time	Non-Sensitive
Warning	Information associated with the reason for the warning. Valid Set: <ul style="list-style-type: none"> Other Error Non Volatile Memory Error Program Execution Error Program Storage Error RAM Error Unexpected Hardware Reset Error Watchdog Error Metrology Firmware Verification Failure Error Measurement Fault Unspecified Smart Meter Operational Integrity Error 	Restriction of xs:string (enumeration)	N/A	N/A	Non-Sensitive

Table 21 Smart Meter Integrity Issue - Warning Device Alerts Parse Response Data Items

15.4.5.4 Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="2.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>00F0</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>81A0</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Smart Meter Integrity Issue – Warning</ra:AlertDescription>
        <ra:Timestamp>2017-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:SmartMeterIntegrityIssueWarningDeviceAlert>
            <ra:Warning>Error Program Execution</ra:Warning>
          </ra:SmartMeterIntegrityIssueWarningDeviceAlert>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 22 - Device Alert 0x81A0 Smart Meter Integrity Issue - Warning Parse Response Sample

15.4.6 Device Alert 0x8F85 Command not supported by Device

This Device Alert (new in GBCS v4.0) is sent by an ESME Device to indicate that it has received a GBCS Command which it cannot support because it does not support all ESME commands. This may be sent by an SAPC (ESME variant G) since they are not required to implement all ESME Commands.

See GBCS section 7.2.9.1 for more details.

15.4.6.1 Format – CommandNotSupportedbyDevice

The diagram shows the structure of CommandNotSupportedbyDevice, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

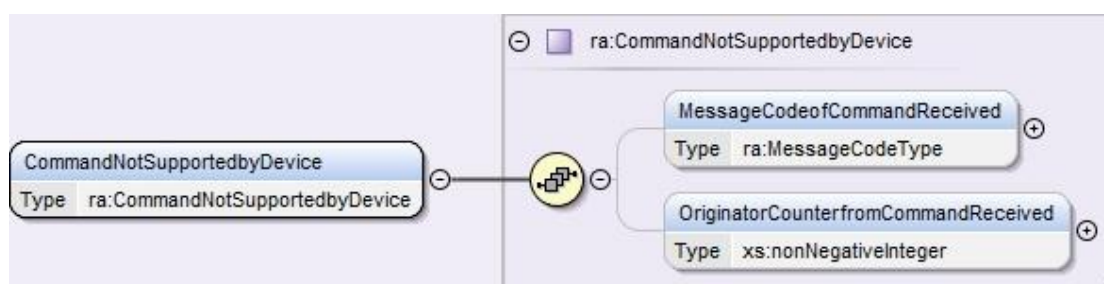


Figure 22.2 – Command not supported by Device - Device Alerts Parse Response Structure Detail

15.4.6.2 Specific Header Data Items

GBCS v4.0 or later:

Data Item	Electricity Alert	Gas Alert
GBCSHexadecimalMessageCode	0120	N/A
<i>GBCS Use Case Number (for information only - not in header)</i>	<i>ECS100</i>	<i>N/A</i>
<i>GBCS Use Case Name (for information only - not in header)</i>	<i>Command not supported by Device</i>	<i>N/A</i>
SupplementaryRemotePartyID	This field shall be included in the Alert if Supplementary Remote Party ID is present in the corresponding Command, and it shall take the same value as in the Command	N/A
SupplementaryRemotePartyCounter	This field shall be included in the Alert if Supplementary Remote Party Counter is present in the corresponding Command, and it shall take the same value as in the Command	N/A
SupplementaryOriginatorCounter	Not Present	N/A
Timestamp	Not Present	N/A

Table 21 ~~Table 24.1~~ Command not supported by Device - Device Alert Header Data Items

15.4.6.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F85	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Command not supported by Device	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	N/A	UTC Date-Time	Non-Sensitive
MessageCodeofCommandReceived	The Message Code of the Command which the Device cannot support. Valid set: A GBCS Message Code that is valid for an ESME	xs:hexBinary	N/A	N/A	Non-Sensitive
OriginatorCounterfromCommandandReceived	The originator counter from the Command which the Device cannot support.	xs:nonNegativeInteger	N/A	N/A	Non-Sensitive

Table 21 ~~Table 24.2~~ Command not supported by Device - Device Alert Parse Response Data Items

15.4.6.4 Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="4.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:SupplementaryRemotePartyID>10-00-20-00-30-00-70-00</ra:SupplementaryRemotePartyID>
    <ra:GBCSHexadecimalMessageCode>0120</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F85</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Command not supported by Device</ra:AlertDescription>
        <ra:Timestamp>2021-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:CommandNotSupportedbyDevice>
            <ra:MessageCodeofCommandReceived>001B</ra:MessageCodeofCommandReceived>
            <ra:OriginatorCounterfromCommandReceived>1501</ra:OriginatorCounterfromCommandReceived>
          </ra:CommandNotSupportedbyDevice>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 22.3 - Device Alert 0x8F85 Command not supported by Device Parse Response Sample

15.4.7 Device Alert 0x8F88 Operational Update

This Device Alert is sent by a Device to indicate that there has been a change in operational status, e.g. where an ESME has executed a change to the commanded state of an Auxiliary Controller. This Device Alert is introduced in GBCS v4.0. See GBCS section 7.2.9.1 for more details.

15.4.7.1 Format - Operational Update

The diagram shows the structure of OperationalUpdateDeviceAlert, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

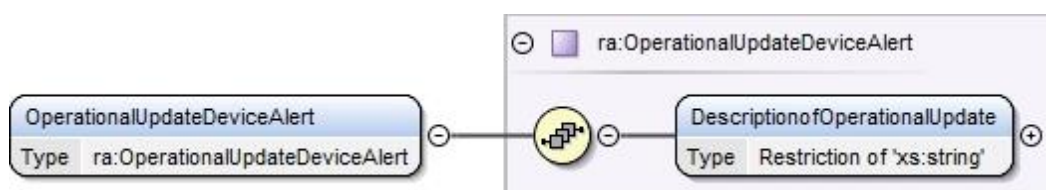


Figure 22.4 – Operational Update - Device Alerts Parse Response Structure Detail

15.4.7.2 Specific Header Data Items

GBCS v4.0 or later:

Data Item	Electricity Alert	Gas Alert
GBCSHexadecimalMessageCode	0123	N/A
GBCS Use Case Number (for information only - not in header)	ECS200	N/A

Data Item	Electricity Alert	Gas Alert
<i>GBCS Use Case Name (for information only - not in header)</i>	<i>OperationalUpdate</i>	<i>N/A</i>
SupplementaryRemotePartyID	If included, the Entity Identifier of either the Supplier, Network Operator or Load Controller	<i>N/A</i>
SupplementaryRemotePartyCounter	Not Present	<i>N/A</i>
SupplementaryOriginatorCounter	Not Present	<i>N/A</i>
Timestamp	Not Present	<i>N/A</i>

Table 21 **Table 24.3 Operational Update - Device Alert Header Data Items**

15.4.7.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F88	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Device Operational Update	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	N/A	UTC Date-Time	Non-Sensitive
OperationalUpdateDeviceAlert	Information from the Device regarding the operational update change made.	OperationalUpdateDeviceAlert (see section 15.4.7.3.1)	N/A	N/A	Non-Sensitive

Table 21 **Table 24.4 Operational Update - Device Alert Parse Response Data Items**

15.4.7.3.1 OperationalUpdateDeviceAlert Data Items Definition

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
OutputState	<p>An integer indicating the output level of an Auxiliary Controller. This value is applicable to output energy, i.e. where the direction of energy flow is from the meter to the controlled load.</p> <p>Where the Auxiliary Controller is an APC, the number reflects the enabled percentage level of energy flow.</p> <p>Where the Auxiliary Controller is an ALCS or HCALCS, 100 shall be interpreted by the Device as meaning closure of the switch (allowing energy to flow) and any other number shall be interpreted as meaning opening of the switch (not allowing energy to flow).</p> <p>Valid set: Integer in the range 0 to 100</p>	<p>ra:AuxiliaryControllerLevel</p> <p>(Restriction of xs:unsignedShort minInclusive = 0, maxInclusive = 100)</p>	None	N/A	Non-Sensitive

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
InputState	<p>An integer indicating the input level of an Auxiliary Controller. This value is applicable to input energy, i.e. where the direction of energy flow is from the controlled load to the meter.</p> <p>This value is only applicable to an Auxiliary Controller that is an APC, and is not applicable to an ALCS or HCALCS. The number reflects the enabled percentage level of energy flow.</p> <p>Valid set: Integer in the range 0 to 100</p>	<p>ra:AuxiliaryControllerLevel</p> <p>(Restriction of xs:unsignedShort minInclusive = 0, maxInclusive = 100)</p>	None	N/A	Non-Sensitive
StateAndAssociatedInformation	<p>Information from the Auxiliary Controller which is in JavaScript Object Notation (JSON) as defined by IETF RFC8259.</p> <p>This provides associated information and incorporates the input and output state, which are also identified separately above.</p>	<p>xs:string</p> <p>(maxLength=1200)</p>	None	N/A	Non-Sensitive

Table 21.5 OperationalUpdateDeviceAlert Data Items

15.4.7.4 Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="4.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:SupplementaryRemotePartyID>10-00-20-00-30-00-70-00</ra:SupplementaryRemotePartyID>
    <ra:GBCSHexadecimalMessageCode>0123</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F88</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Device Operational Update</ra:AlertDescription>
        <ra:Timestamp>2021-05-04T18:13:51.00</ra:Timestamp>
        <ra:Payload>
          <ra:OperationalUpdateDeviceAlert>
            <ra:OutputState>50</ra:OutputState>
            <ra:InputState>75</ra:InputState>
            <ra:StateAndAssociatedInformation>{"outputState": 50, "inputState": 75 other-data
          }</ra:StateAndAssociatedInformation>
          <ra:OperationalUpdateDeviceAlert>
            <ra:Payload>
              <ra:DeviceAlertContent>
                <ra:DeviceAlertMessage>
                  <ra:Body>
                    </ra:GBCSResponse>
```

Figure 22.5 - Device Alert 0x8F88 OperationalUpdate Parse Response Sample

15.4.8 Device Alert 0x8F86 Limit APC Level Command Processed

This Device Alert is sent by a Device to indicate that the Device has processed a Command to create an APC [n] Limit Period, which is established by Service Request 7.16 Limit APC Level. An APC [n] Limit Period may be applied to energy flow for output to or input from the controlled load.

This Device Alert is introduced in GBCS v4.0. See GBCS section 7.2.9.1 for more details.

15.4.8.1 Format - Limit APC Level Command Processed

The diagram shows the structure of LimitAPCLevelCommandProcessedDeviceAlert, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

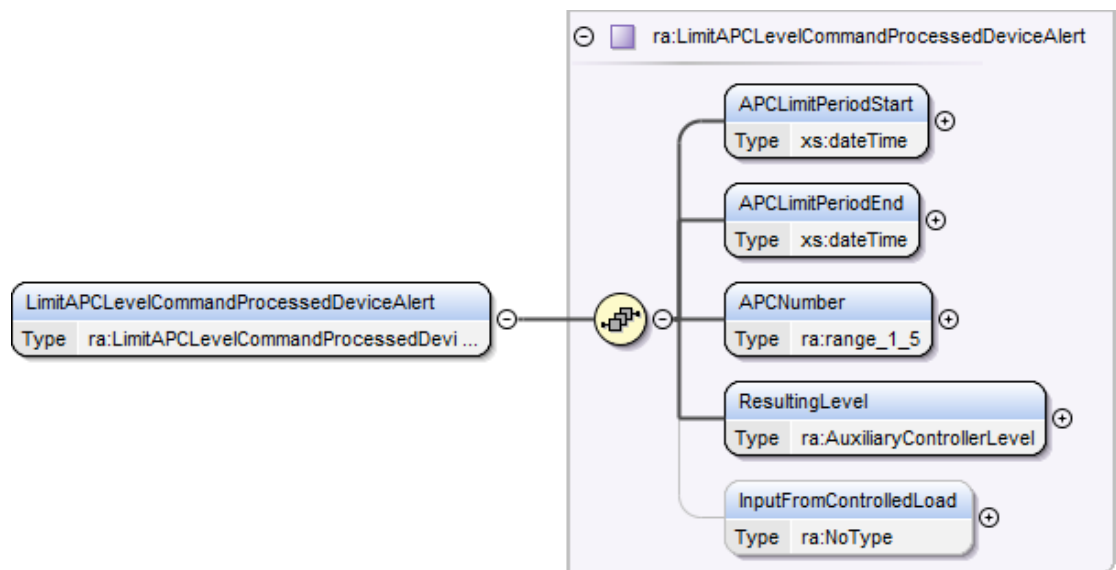


Figure 22.6 – Limit APC Level Command Processed - Device Alerts Parse Response Structure Detail

15.4.8.2 Specific Header Data Items

GBCS v4.0 or later:

Data Item	Electricity Alert	Gas Alert
GBCSHexadecimalMessageCode	0121	N/A
GBCS Use Case Number (for information only - not in header)	ECS101	N/A
GBCS Use Case Name (for information only - not in header)	Limit APC [n] Level Command processed	N/A
SupplementaryRemotePartyID	Not Present	N/A
SupplementaryRemotePartyCounter	Not Present	N/A
SupplementaryOriginatorCounter	Not Present	N/A
Timestamp	Not Present	N/A

Table 21.6 Limit APC Level Command Processed - Device Alert Header Data Items

15.4.8.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F86	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Limit APC Level Command Processed	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	N/A	UTC Date-Time	Non-Sensitive
APCLimitPeriodStart	The start of the APC Limit Period	xs:dateTime	N/A	N/A	Non-Sensitive
APCLimitPeriodEnd	The end of the APC Limit Period.	xs:dateTime	N/A	N/A	Non-Sensitive
AuxiliaryControllerN	The index on the Device of the Auxiliary Controller to which this Device Alert applies. A Device may have up to 5 Auxiliary Controllers. This Device Alert is applicable only to an Auxiliary Controller that is an APC.	ra:range_1_5 (Restriction of xs:positiveInteger minInclusive = 1, maxInclusive = 5)	N/A	UTC Date-Time	Non-Sensitive
ResultingLevel	The limit applied to the APC of the level of energy flow. The level is the percentage, where 0 means no energy flow. Valid set: Integer in the range 0 to 100	ra:AuxiliaryControllerLevel (Restriction of xs:unsignedShort minInclusive = 0, maxInclusive = 100)	N/A	N/A	Non-Sensitive
InputFromControlledLoad	If present, this element indicates that the direction of energy flow limit is with respect to input energy from the controlled load Device. If not present then the direction of energy limit is with respect to output energy to the controlled load Device	ra:NoType (see Annex 17)	No	None	N/A

Table 21-Table 24.7 Limit APC Level Command Processed - Device Alert Parse Response Data Items

15.4.8.4 Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="4.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>0121</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F86</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Limit APC Level Command Processed</ra:AlertDescription>
        <ra:Timestamp>2021-12-01T17:00:01.35</ra:Timestamp>
        <ra:Payload>
          <ra:LimitAPCLevelCommandProcessedDeviceAlert>
            <ra:APCLimitPeriodStart>2021-12-01T17:00:00.00</ra:APCLimitPeriodStart>
            <ra:APCLimitPeriodEnd>2021-12-01T18:59:59.00Z</ra:APCLimitPeriodEnd>
            <ra:AuxiliaryControllerN>3</ra:AuxiliaryControllerN>
            <ra:ResultingLevel>40</ra:ResultingLevel>
          </ra:LimitAPCLevelCommandProcessedDeviceAlert>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 22.7 - Device Alert 0x8F86 Limit APC Level Command Processed Parse Response Sample

15.4.9 Device Alert 0x8F87 Limit APC Level Ended or Cancelled

This Device Alert is sent by a Device to indicate that an APC Limit Period, established by a Service Request 7.16 Limit APC Level, has ended.

This Device Alert is introduced in GBCS v4.0. See GBCS section 7.2.9.1 for more details.

15.4.9.1 Format - Limit APC Level Ended

The diagram shows the structure of LimitAPCLevelEndedDeviceAlert, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

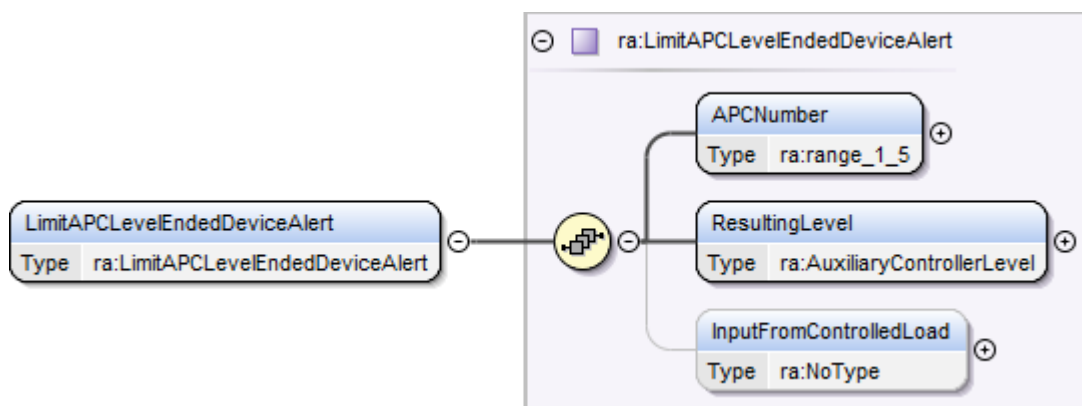


Figure 22.8 – Limit APC Level Ended - Device Alerts Parse Response Structure Detail

15.4.9.2 Specific Header Data Items

GBCS v4.0 or later:

Data Item	Electricity Alert	Gas Alert
GBCSHexadecimalMessageCode	0122	N/A
<i>GBCS Use Case Number (for information only - not in header)</i>	<i>ECS102</i>	<i>N/A</i>
<i>GBCS Use Case Name (for information only - not in header)</i>	<i>Limit APC [n] Level ended or cancelled</i>	<i>N/A</i>
SupplementaryRemotePartyID	Not Present	N/A
SupplementaryRemotePartyCounter	Not Present	N/A
SupplementaryOriginatorCounter	Not Present	N/A
Timestamp	Not Present	N/A

Table 21.8 Limit APC Level Ended - Device Alert Header Data Items

15.4.9.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F87	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Limit APC Level Ended or Cancelled	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	N/A	UTC Date-Time	Non-Sensitive
AuxiliaryControllerN	The index on the Device of the Auxiliary Controller to which this Device Alert applies. A Device may have up to 5 Auxiliary Controllers. This Device Alert is applicable only to an Auxiliary Controller that is an APC.	ra:range_1_5 (Restriction of xs:positiveInteger minInclusive = 1, maxInclusive = 5)	N/A	N/A	Non-Sensitive
ResultingLevel	The level of energy flow in the APC after the ending of the APC level limit period. The level is the percentage; 100 means maximum energy flow and 0 means no energy flow. Valid set: Integer in the range 0 to 100	ra:AuxiliaryControllerLevel (Restriction of xs:unsignedShort minInclusive = 0, maxInclusive = 100)	N/A	N/A	Non-Sensitive
InputFromControlledLoad	If present, this element indicates that the direction of energy flow limit is with respect to input energy from the controlled load Device. If not present then the direction of energy limit is with respect to output energy to the controlled load Device	ra:NoType (see Annex 17)	No	None	N/A

Table 21.9 Limit APC Level Ended - Device Alert Parse Response Data Items

15.4.9.4 Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<ra:GBCSResponse xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:sr="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.dccinterface.co.uk/ResponseAndAlert" schemaVersion="4.0">
  <ra:Header>
    <ra:BusinessOriginatorID>10-20-30-40-50-60-70-80</ra:BusinessOriginatorID>
    <ra:BusinessTargetID>10-00-20-00-30-00-40-00</ra:BusinessTargetID>
    <ra:OriginatorCounter>50</ra:OriginatorCounter>
    <ra:GBCSHexadecimalMessageCode>0122</ra:GBCSHexadecimalMessageCode>
  </ra:Header>
  <ra:Body>
    <ra:DeviceAlertMessage>
      <ra:DeviceAlertContent>
        <ra:GBCSHexAlertCode>8F87</ra:GBCSHexAlertCode>
        <ra:AlertDescription>Limit APC Level Ended or Cancelled</ra:AlertDescription>
        <ra:Timestamp>2021-12-01T19:00:25.42</ra:Timestamp>
        <ra:Payload>
          <ra:LimitAPCLevelEndedDeviceAlert>
            <ra:AuxiliaryControllerN>3</ra:AuxiliaryControllerN>
            <ra:ResultingLevel>40</ra:ResultingLevel>
            <ra:InputFromControlledLoad/>
          </ra:LimitAPCLevelEndedDeviceAlert>
        </ra:Payload>
      </ra:DeviceAlertContent>
    </ra:DeviceAlertMessage>
  </ra:Body>
</ra:GBCSResponse>
```

Figure 22.9 - Device Alert 0x8F87 Limit APC Level Ended Parse Response Sample

15.5 SMETS1 Alert Format

This section describes the information which will be sent with SMETS1 Alerts to DCC Service Users.

15.5.1 SMETS1 Alerts With No Additional Payload

Most SMETS1 Alerts consist of just an Alert Code without any substantial additional data. The SMETS1 Alert Format is described in Annex 19, section 19.4.3.2.

SMETS1 Alert codes are communicated in the GBCSHexAlertCode XML element. Some are in common with GBCS definitions, and others are not defined in GBCS. The DCC shall maintain and publish to all Users the list of SMETS1 Alert Codes.

15.5.2 SMETS1 Alerts 0x8F1C and 0x8F72 Firmware Verification Status

These two SMETS1 Alerts returns the result of Firmware verification as part of the distribution of Firmware upgrades, as follows:

- Alert Code 0x8F1C indicates that it failed
- Alert Code 0x8F72 indicates that it was successful

The same additional payload is conveyed in each case.

See GBCS section 11.2.6 for more details. Note that this Alert type is also referred to in GBCS as "Firmware Distribution Receipt Alert".

15.5.2.1 Format - FirmwareVerificationDeviceAlertType

The diagram shows the structure of FirmwareVerificationDeviceAlertType, which is the XML type used for these Alerts in the Payload part of the Alert structure. See Figure 4 in section 15.3.3 to see how this fits in to the Device Alert response structure as a whole.

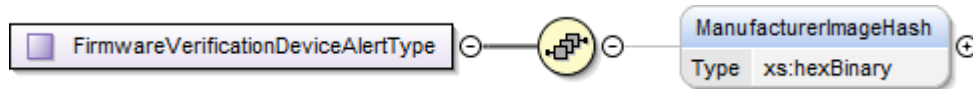


Figure 23 – Firmware Verification SMETS1 Alerts SMETS1 Response Structure Detail

15.5.2.2 Specific Header Data Items

Data Item	Electricity Alert	Gas Alert	Firmware verification failed for CHF or PPMID	Firmware verification successful for CHF or PPMID
GBCSHexadecimal MessageCode	00CE	00CF	1002	1003
GBCS Use Case Number (for information only - not in header)	N/A	N/A	N/A	N/A
GBCS Use Case Name (for information only - not in header)	Firmware Distribution Receipt Alert (ESME)	Firmware Distribution Receipt Alert (GSME)	N/A	N/A
SupplementaryRemotePartyID	Not Present	Not Present	Not Present	Not Present
SupplementaryRemotePartyCounter	Not Present	Not Present	Not Present	Not Present
SupplementaryOriginatorCounter	Not Present	Not Present	Not Present	Not Present
Timestamp	Not Present	Not Present	Not Present	Not Present

Table 22 Firmware Verification SMETS1 Alerts Header Data

15.5.2.3 Specific Body Data Items

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
GBCSHexAlertCode	8F1C or 8F72	xs:hexBinary	N/A	N/A	Non-Sensitive
AlertDescription	Firmware verification failed, or Firmware verification succeeded	xs:string (maxLength = 250)	N/A	N/A	Non-Sensitive
Timestamp	The Device Alert timestamp as sent by the Device, in UTC time.	xs:dateTime	N/A	UTC Date-Time	Non-Sensitive

Data Item	Description / Valid Set	Type	Default	Units	Sensitivity
ManufacturerImageHash	<p>Information associated with the firmware update.</p> <p>The Firmware hash as held in the CPL and presented in the format XX..XX (64 characters) where each X is one of the characters 0 to 9 or A to F.</p> <p>This data item should match the value on the CPL (excluding the colon separator between octet values)</p> <p>Note that a hexBinary value of length 32 is defined as 32 octets, an octet is represented by 2 characters.</p>	xs:hexBinary (maxLength = 32)	N/A	N/A	Non-Sensitive

Table 23 Firmware Verification SMETS1 Alerts SMETS1 Response Data Items

15.5.2.4 Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<Response xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns="http://www.dccinterface.co.uk/ServiceUserGateway"
  xmlns:ra="http://www.dccinterface.co.uk/ResponseAndAlert"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" schemaVersion="3.0">
  <Header>
    <RequestID>11-22-33-44-55-66-77-88-99-00-AA-BB-CC-DD-EE-FF:50</RequestID>
    <ResponseCode>I0</ResponseCode>
    <ResponseDateTime>2017-08-25T03:04:05.00</ResponseDateTime>
  </Header>
  <Body>
    <SMETS1ResponseMessage>
      <SMETS1SignedResponse schemaVersion="3.0">
        <SMETS1Response>
          <Header>
            <ra:BusinessOriginatorID>99-00-AA-BB-CC-DD-EE-FF</ra:BusinessOriginatorID>
            <ra:BusinessTargetID>11-22-33-44-55-66-77-88</ra:BusinessTargetID>
            <ra:OriginatorCounter>50</ra:OriginatorCounter>
          </Header>
          <Body>
            <DeviceAlertMessage>
              <ra:DeviceAlertContent>
                <ra:GBCSHexAlertCode>8F1C</ra:GBCSHexAlertCode>
                <ra:AlertDescription>Firmware verification failed</ra:AlertDescription>
                <ra:Timestamp>2014-05-04T18:13:51.00</ra:Timestamp>
                <ra:Payload>
                  <ra:FirmwareVerificationDeviceAlert>
                    <ra:ManufacturerImageHash>0123456789ABCDEF0123456789ABCDEF0123456789ABCDEF0123456789ABCDEF
                    </ra:ManufacturerImageHash>
                    <ra:FirmwareVerificationDeviceAlert>
                      <ra:Payload>
                        <ra:DeviceAlertContent>
                          </DeviceAlertContent>
                        </ra:Payload>
                      </ra:FirmwareVerificationDeviceAlert>
                    </ra:DeviceAlertContent>
                  </ra:DeviceAlertContent>
                </ra:DeviceAlertContent>
              </DeviceAlertMessage>
            </Body>
          </SMETS1Response>
        </SMETS1SignedResponse>
      </SMETS1ResponseMessage>
    </Body>
  </Response>
```

Figure 24 – SMETS1 Alert 0x8F1C Firmware Verification Failed SMETS1 Response Sample