

# Extended Service Description regarding the MetarDescriptionWFS

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Reference Date: 2019-03-22  
Edition: 0.2

## Service Behaviour

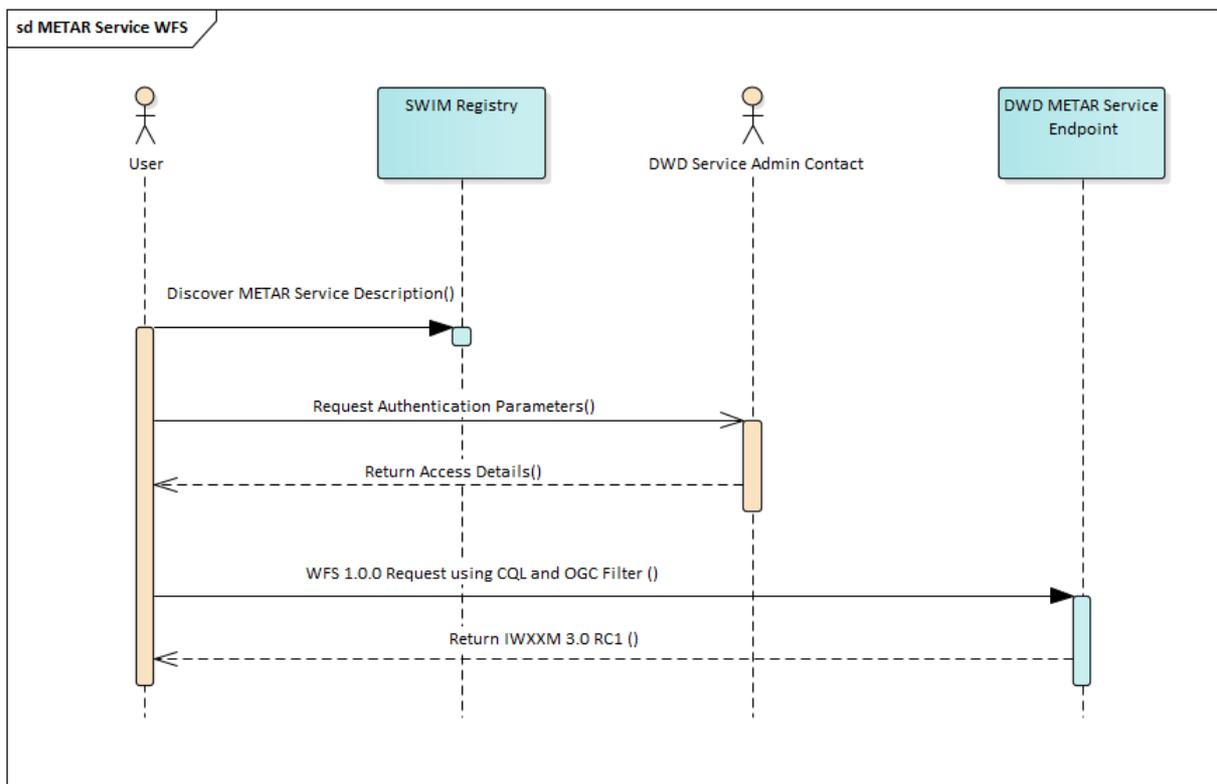


Figure 1: Sequence diagram showing the process from discovery of the METAR service to the use of the service. To use the service properly there are two steps to do. First request authentication parameters from the DWD service administrator using the contact details stated within the Service Description. After receiving the access details (for HTTP basic authentication) the service can be used.

## Example Code

To use the service, you first need to inquire for access. Please refer to the contact details stated in the Service Description document. The service uses HTTP basic authentication, so a username and passwords will be sent to you which are to be set in the HTTP header field.

## Example Request 1

The following example shows how to request the latest METAR for the aerodrome Frankfurt a. M. with the ICAO location code **EDDF**. The service applies to the Geoserver and uses the OGC WFS 1.0.0 profile. The service can be used with filtering methods. Here a combination of CQL filter (see: [https://docs.geoserver.org/stable/en/user/tutorials/cql/cql\\_tutorial.html](https://docs.geoserver.org/stable/en/user/tutorials/cql/cql_tutorial.html)) and OGC filter are used to select METARs meeting certain criteria (see <https://www.opengeospatial.org/standards/filter>).

[https://maps.dwd.de/geoserver/dwd/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=dwd:METAR\\_IWXXM3&maxFeatures=1&sortBy=INCOMING\\_DATE+D&FILTER=<PropertyIsEqualTo><PropertyName>ICA0\\_CODE</PropertyName><Literal>EDDF</Literal></PropertyIsEqualTo>](https://maps.dwd.de/geoserver/dwd/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=dwd:METAR_IWXXM3&maxFeatures=1&sortBy=INCOMING_DATE+D&FILTER=<PropertyIsEqualTo><PropertyName>ICA0_CODE</PropertyName><Literal>EDDF</Literal></PropertyIsEqualTo>)

For the following ICAO locations the METAR service can be requested. To choose the appropriate aerodrome the respective ICAO\_CODE is to be set within the filter:

<PropertyIsEqualTo><PropertyName>ICA0\_CODE</PropertyName><Literal>EDDF</Literal></PropertyIsEqualTo>

ICAO_CODE	ICAO_NAME	ICAO_CODE	ICAO_NAME
EDAC	Leipzig-Altenburg	EDFM	Mannheim/City
EDAH	Heringsdorf	EDGS	Siegerland
EDDB	Berlin/Schönefeld	EDHI	Hamburg-Finkenwerder
EDDC	Dresden/Klotzsche	EDHK	Kiel-Holtenau
EDDE	Erfurt/Bindersleben	EDHL	Lübeck-Blankensee
EDDF	Frankfurt/Main \$ Frankfurt RAD	EDJA	Memmingen/Allgäu
EDDG	Münster/Intl	EDLN	Mönchengladbach
EDDH	Hamburg/Fuhlsbüttel\$Hamburg RA	EDLP	Paderborn/Lippstadt
EDDK	Köln/Köln-Bonn	EDLV	Niederrhein
EDDL	Düsseldorf	EDLW	Dortmund
EDDM	München/FJS Intl	EDMA	Augsburg
EDDN	Nürnberg	EDMO	Oberpfaffenhofen
EDDP	Leipzig/Schkeuditz	EDNY	Friedrichshafen
EDDR	Saarbrücken/Intl	EDOP	Schwerin-Parchim
EDDS	Stuttgart/Echterdingen	EDQM	Hof-Plauen
EDDT	Berlin/Tegel	EDSB	Karlsruhe/Baden-Baden
EDDV	Hannover/Langenhagen\$Hannover	EDTL	Lahr
EDDW	Bremen	EDTY	Schwäbisch Hall
EDFH	Hahn	EDVE	Braunschweig-Wolfsburg
		EDVK	Kassel/Calden

Table 1: The table shows the aerodromes identified by the ICAO location code which are available within the METAR service.

## Example Response 1

The following graphic illustrates the response of the service. Within the DATASET attribute the information of interest (METAR in IWXXM) are delivered.

```
-<wfs:FeatureCollection xsi:schemaLocation="http://www.dwd.de https://qs-maps.dwd.de:443/geoserver/dwd/wfs?service=WFS&version=1.0.0&request=DescribeFeatureType&typeName=dwd%3AMETAR_IWXXM3
http://www.opengis.net/wfs https://qs-maps.dwd.de:443/geoserver/schemas/wfs/1.0.0/WFS-basic.xsd">
  -<gml:boundedBy>
    -<gml:Box srsName="http://www.opengis.net/gml/srs/epsg.xml#4326">
      <gml:coordinates decimal="," cs="," ts=" " >8.5705,50.0333 8.5705,50.0333</gml:coordinates>
    </gml:Box>
  </gml:boundedBy>
  -<gml:featureMember>
    -<dwd:METAR_IWXXM3 fid="METAR_IWXXM3.fid-5572e906_169a48cda7_46ed">
      -<gml:boundedBy>
        -<gml:Box srsName="http://www.opengis.net/gml/srs/epsg.xml#4326">
          <gml:coordinates decimal="," cs="," ts=" " >8.5705,50.0333 8.5705,50.0333</gml:coordinates>
        </gml:Box>
      </gml:boundedBy>
      -<dwd:DATASET>
        <?xml version="1.0" encoding="utf-8"?> <!--METAR EDDF 220650Z 05009KT CAVOK 06/03 Q1031 NOSIG--> <iwxxm:METAR xmlns:xsi="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org
/2001/XMLSchema-instance" xmlns:iwxxm="http://icao.int/iwxxm/3.0" xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:aixm="http://www.aixm.aero/schema/5.1.1" xmlns:xlink="http://www.w3.org/1999/xlink"
automatedStation="false" status="NORMAL" permissibleUsage="NON-OPERATIONAL" permissibleUsageReason="TEST" gml:id="uuiid.1b1ad347-9d24-4d0e-a1bd-3d864f5efdd1" xsi:schemaLocation="http://icao.int
http://schemas.wmo.int/iwxxm/3.0/0/RC1/iwxxm.xsd http://www.opengis.net/samplingSpatial/2.0 http://schemas.opengis.net/samplingSpatial/2.0/spatialSamplingFeature.xsd"> <iwxxm:issueTime> <gml:TimeInstant
gml:id="uuiid.9a5e5ef2-8ed8-4100-ba91-6707b0a0a255"> <gml:timePosition>2019-03-22T06:50:00Z</gml:timePosition> </gml:TimeInstant> </iwxxm:aerodrome> <aixm:AirportHeliport
gml:id="uuiid.2a494de8-771d-4fda-a33d-ec5be677ca56"> <aixm:timeSlice> <aixm:AirportHeliportTimeSlice gml:id="uuiid.698d5180-2bdd-4627-96ce-a25cacecf1e7"> <gml:validTime/>
<aixm:interpretation>BASELINE</aixm:interpretation> <aixm:designator>EDDF</aixm:designator> <aixm:name>FRANKFURT MAIN</aixm:name> <aixm:locationIndicator>CAO</aixm:locationIndicator>
<aixm:ARP> <aixm:ElevatedPoint srsName="http://www.opengis.net/def/crs/EPSPG/0/4326" srsDimension="2" gml:id="uuiid.cd76f644-7ba4-488a-a143-aa437b9e7d89"> <gml:pos>50.03 8.57</gml:pos> </aixm:Elevat
</aixm:ARP> </aixm:AirportHeliportTimeSlice> </aixm:timeSlice> </aixm:AirportHeliport> </iwxxm:aerodrome> <iwxxm:observationTime> <gml:TimeInstant gml:id="uuiid.90499b4b-73a4-4a7e-9b2b-4be749633d0
c574b93b6380" cloudAndVisibilityOK="true"> <iwxxm:airTemperature uom="Cel">6</iwxxm:airTemperature> <iwxxm:dewpointTemperature uom="Cel">3</iwxxm:dewpointTemperature> <iwxxm:qnh
uom="hPa">1031</iwxxm:qnh> <iwxxm:surfaceWind> <iwxxm:AerodromeSurfaceWind variableWindDirection="false"> <iwxxm:meanWindDirection uom="deg">50</iwxxm:meanWindDirection> <iwxxm:meanWir
uom="[kn_i]">9</iwxxm:meanWindSpeed> </iwxxm:AerodromeSurfaceWind> </iwxxm:observationTime> </iwxxm:observation> </iwxxm:METAR>
</dwd:DATASET>
<dwd:INCOMING_DATE>2019-03-22T06:53:04</dwd:INCOMING_DATE>
<dwd:ICAO_CODE>EDDF</dwd:ICAO_CODE>
<dwd:ICAO_NAME>Frankfurt/Main $ Frankfurt RAD</dwd:ICAO_NAME>
<dwd:LATITUDE>50.033306</dwd:LATITUDE>
<dwd:LONGITUDE>8.570456</dwd:LONGITUDE>
  -<dwd:THE_GEOM>
    -<gml:Point srsName="http://www.opengis.net/gml/srs/epsg.xml#4326">
      <gml:coordinates decimal="," cs="," ts=" " >8.5705,50.0333</gml:coordinates>
    </gml:Point>
  </dwd:THE_GEOM>
</dwd:METAR_IWXXM3>
</gml:featureMember>
</wfs:FeatureCollection>
```

Figure 2: Example response 1, retrieve the latest METAR for the specified aerodrome.

## Example Request 2

The following example shows how to request all METARs (from German aerodromes) which are later than the specified date time (attribute: INCOMING\_DATE). The service applies to the Geoserver and uses the OGC WFS 1.0.0 profile. This functionality of the service intends to deliver all available METARs from the actual day. Thus, the return value is limited to 2000 METARs or features which is indicated by the maxFeatures=2000 value.

The service uses OGC filter to meet the criteria (for further information see: <https://www.opengeospatial.org/standards/filter>).

[https://maps.dwd.de/geoserver/dwd/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=dwd%3A%3AMETAR\\_IWXXM3&maxFeatures=2000&FILTER=<PropertyIsGreaterThan><PropertyName>INCOMING\\_DATE</PropertyName><Literal>2019-03-26T10:40:00Z</Literal></PropertyIsGreaterThan>](https://maps.dwd.de/geoserver/dwd/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=dwd%3A%3AMETAR_IWXXM3&maxFeatures=2000&FILTER=<PropertyIsGreaterThan><PropertyName>INCOMING_DATE</PropertyName><Literal>2019-03-26T10:40:00Z</Literal></PropertyIsGreaterThan>)



## Information Definition and AIRM Conformance

This part provides the Information Definition and the AIRM mapping of the WFS payload. The IWXXM reports are delivered within the WFS 1.0.0 GML wrapper. The focus lies on the attributes or concepts within the GML element featureMember (see below). Within the DATASET attribute the METAR reports in IWXXM 3.0RC1 are exchanged.

### Information Definition for the information exchange of interest

<b>Identification</b>	
<b>Title</b>	WFS 1.0.0 METARs IWXXM3.0 Mapping File
<b>Edition</b>	0.3
<b>ReferenceDate</b>	18.03.2019
<b>ResponsibleParty</b>	
<b>Name</b>	Deutscher Wetterdienst
<b>ContactDetails</b>	http://www.dwd.de
<b>Role</b>	author
<b>Scope</b>	
	Information in support of the Service delivering IWXXM via Web Feature Service 1.0.0 and using GML 3.1.1 as output format. This includes both METAR and SPECI reports in IWXXM 3.0.0RC1 for selected airports in Germany. Those IWXXM are validated with Crux software, a tool provided by WMO for authoritative validation purposes.
<b>Concepts</b>	
	gml:featureMember <a href="#">DATASET</a> <a href="#">INCOMING_DATE</a> <a href="#">STATUS</a> <a href="#">ICAO_CODE</a> <a href="#">ICAO_NAME</a> <a href="#">LATITUDE</a> <a href="#">LONGITUDE</a> <a href="#">THE_GEOM</a>

### AIRM mapping

<b>concept</b>	<b>DATASET</b>
<b>description</b>	This is the requested dataset or payload of interest. It contains either one single METAR or SPECI report in IWXXM version 3.0.0RC1. Those IWXXM are validated by the Crux Software (version 1.4), a tool provided by WMO for authoritative validation purposes.
<b>dataType</b>	characterString
<b>AIRM_mapping</b>	
<b>semanticTrace</b>	(see mappingComment)
<b>definitionTrace</b>	urn:aero:airm:1.0.0:ConceptualModel:Subjects:AirTrafficOperations:InformationServicesProducts:MeteorologicalInformationProduct:METAR urn:aero:airm:1.0.0:ConceptualModel:Subjects:AirTrafficOperations:InformationServicesProducts:MeteorologicalInformationProduct:SPECI
<b>CR</b>	49
<b>mappingComment</b>	In fact the mapping on IWXXM would be the semantic trace but this is not sufficient at the time! Because of the resulting incomplete mapping a change request for the AIRM was made.

<b>concept</b>	<b>INCOMING_DATE</b>
<b>description</b>	This is the date and time the file was processed within the system of the originator and written to database.  NOTE: This might differ from the issue time of the report in DATASET.
<b>dataType</b>	dateTime
<b>AIRM_mapping</b>	outOfScope   <i>system</i>
<b>concept</b>	<b>STATUS // not mandatory</b>
<b>description</b>	This indicates the usability of DATASET.
<b>dataType</b>	characterString
<b>AIRM_mapping</b>	
<b>semanticTrace</b>	urn:aero:airm:1.0.0:LogicalModel:Abstract:Entity@lifeCycle Status
<b>concept</b>	<b>ICAO_CODE</b>
<b>description</b>	A four-letter code in accordance with ICAO rules and assigned to an aerodrome. NOTE: This service only covers german airports!
<b>dataType</b>	characterString
<b>AIRM_mapping</b>	
<b>semanticTrace</b>	urn:aero:airm:1.0.0:LogicalModel:Subjects:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@locationIndicatorICAO
<b>concept</b>	<b>ICAO_NAME</b>
<b>description</b>	The primary official name of an aerodrome as designated by an appropriate authority. NOTE: This service only covers german airports!
<b>dataType</b>	characterString
<b>AIRM_mapping</b>	
<b>semanticTrace</b>	urn:aero:airm:1.0.0:LogicalModel:Subjects:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@name
<b>concept</b>	<b>LATITUDE</b>
<b>description</b>	Geographical indication in north-south direction.
<b>dataType</b>	decimal
<b>AIRM_mapping</b>	outOfScope   <i>container</i>
<b>concept</b>	<b>LONGITUDE</b>
<b>description</b>	Geographical indication in east-west direction.
<b>dataType</b>	decimal
<b>AIRM_mapping</b>	outOfScope   <i>container</i>
<b>concept</b>	<b>THE_GEOM</b>
<b>description</b>	Point location in GML. It contains the values of LATITUDE and LONGITUDE on an EPSG-4326 projection for the aerodrome (ICAO_CODE/NAME).
<b>dataType</b>	decimal
<b>AIRM_mapping</b>	
<b>semanticTrace</b>	urn:aero:airm:1.0.0:LogicalModel:Abstract:GeoEnabledEntity@position
<b>definitionTrace</b>	urn:aero:airm:1.0.0:ConceptualModel:Subjects:BaseInfrastructure:AerodromeInfrastructure:AerodromeReferencePoint urn:aero:airm:1.0.0:ConceptualModel:Subjects:Common:Geometry:WorldGeodeticSystem1984
<b>mappingComment</b>	There is just a concept for a geographical position consisting of two coordinates (lon,lat) but not the coordinates themselves (lon and lat).