
Documedis CDS.CE Integration Specification

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1 Introduction

The target groups of this document are product owners, product managers and software developers interested in integrating Documedis CDS.CE to their software.

2 Information about the product CDS.CE

2.1 What is CDS.CE?

The product Documedis CDS.CE is a web-based software that checks the used or planned medication of a patient for health risks. Documedis CDS.CE has the two main functionalities "Med Check" and "Vac Check":

Documedis CDS.CE

<https://ce.documedis.hcisolutions.ch/cds/2021-01>

HTML

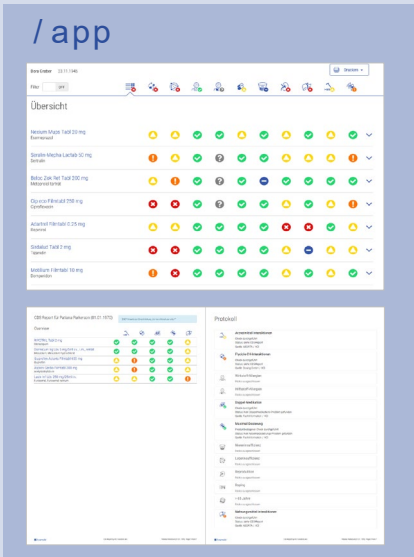
PDF

JSON

JSON
FHIR

Med Check

[/ app](#)

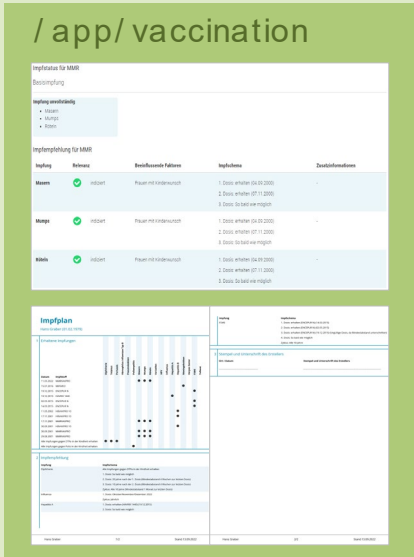


[/ api](#)

- [/ cds/ checks/ summarized](#)
- [/ cds/ checks/ detailed](#)
- [/ cds/ risks/ ...](#)

Vac Check

[/ app/ vaccination](#)



[/ api/ vaccination](#)

Figure 1 Overview CDS.CE functionalities

	CDS.CE Med Check	CDS.CE Vac Check
APP (UI)	- Display the result in HTML format - Display the result in PDF format	- Display the result in HTML format - Display the result in PDF format
API	Based on JSON/REST - Do a Med Check and get a summarized result (to display a single icon summary) - Do a Med Check and get a detailed result (to display results for each medication) - Get lists of risks by check type or query keyword (to simplify proper patient risk encoding)	Based on FHIR - Do a Vac Check and get the detailed result for specific check - Do a Vac Check and get the detailed result for generic check

Currently CDS.CE can check the following risks or vaccinations:

Med Checks

- >65 years (elderly people)
- Diabetes
- Doping
- Double Medication
- Driving ability
- Drug interactions
- Excipient allergy
- Flycicle-CH interactions
- Food interactions
- Liver insufficiency
- Maximum dosage
- Renal insufficiency
- Reproduction
- Substance allergy

Vac Checks

- Diphtheria
- Haemophilus influenzae type b
- Hepatitis A
- Hepatitis B
- Herpes Zoster
- Human papilloma viruses
- Influenza
- Measles
- Meningococci
- Mumps
- Pertussis
- Pneumococci
- Poliomyelitis
- Rabies
- Rubella
- TBE
- Tetanus
- Varicella

2.2 Intended Purpose

The product Documedis CDS.CE is a web-based software that checks the used or planned medication of a patient for health risks. In this way, the software supports healthcare professionals from doctors' practices, hospitals, pharmacies, spitex and homes in making decisions about medication therapy. The support is provided with the help of various checks that give medication warnings and recommendations.

The product is offered as a web API and web application and can be integrated by primary system providers from the healthcare sector into their software.

2.3 Exclusions

The product is not intended for the detection, monitoring, treatment or alleviation of diseases. It must not be used to automatically derive therapy decisions or to control automated therapeutic processes. The final decision regarding medication always lies with the healthcare professional. The product is only intended to support decision-making.

2.4 Residual Risks

The following residual risks should be considered when using Documedis CDS.CE:

- If Documedis CDS.CE does not work and no result is displayed, the patient may be exposed to pharmacological hazards.
- If Documedis CDS.CE does not work and no result of check "driving" is displayed, this may lead to a drug being prescribed that impairs the ability to operate machines or drive vehicles. In the worst case, this can lead to a risk of injury to the patient (car accident, accident involving machinery, etc.).
- If the user's primary system is not sufficiently protected (security updates, antivirus), it is possible that it may be used by unauthorized or incorrectly trained users.

3 General Information about the integration of CDS.CE

3.1 Environments

We provide the following environments:

- Integration environment: <https://int.ce.documedis.hcisolutions.ch/cds/2021-01...>
- Production environment: <https://ce.documedis.hcisolutions.ch/cds/2021-01...>

Please do not use the production environment for testing purposes but only the designated integration environment.

3.2 Requirements - Prerequisites

The following browsers are supported by Documedis CDS.CE:

- Google Chrome (from version 80)
- Microsoft Edge (from version 80)
- Mozilla Firefox (from version 80)
- Safari (from version 14.1)
- embedded Browser (from .NET Framework 4.8)

The minimum screen size for displaying the HTML page must be 1280x400 pixels. A warning is displayed if the window is less than 1280 pixels wide or less than 400 pixels high.



Figure 2 Warning "The screen is too small for optimal display"

3.3 SLA/Availability/Performance

We will guarantee an availability of 99.5% and service time is 7x24h. Due to the connected nature of the internet, we are unable to guarantee any end-to-end performance values.

3.4 Data Protection and Cybersecurity

The integrator is responsible to implement state of the art technical and organizational measures.

3.5 Access Control

You can access Documedis CDS.CE with a token which is provided from HCI. If you call Documedis CDS.CE it must match with the one stored on our backend for the HCI SoftwareOrgId field provided in the request.

4 Integration of CDS.CE Med Check

4.1 Overview

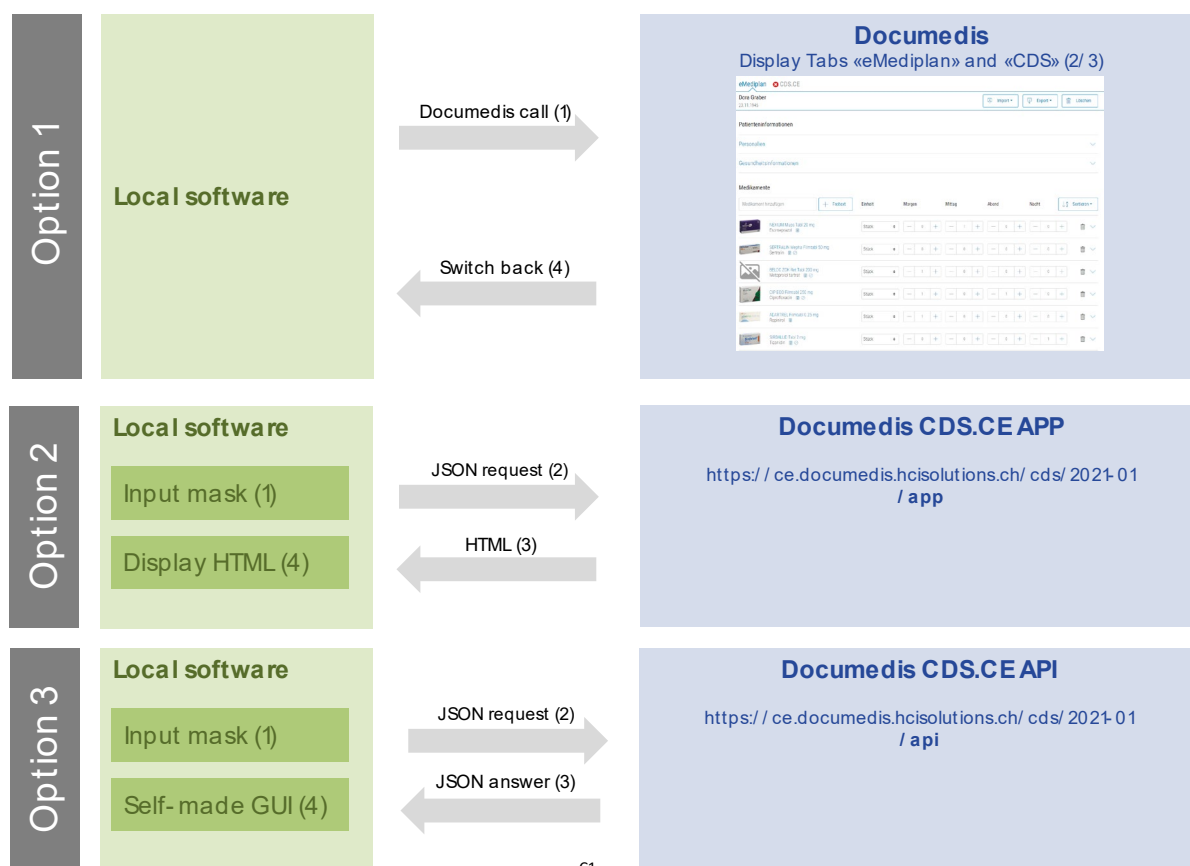


Figure 3 Integration Options CDS.CE Med Check

Option 1	Option 2	Option 3
1. Documedis call with the tabs «eMediplan» and «CDS» 2. Enter the data in Documedis in the tab «eMediplan» 3. Display the results in Documedis in the tab «CDS» 4. If the consultation is finished, switch back to local system	1. Enter the Data in self-made input mask of local system 2. Local system sends a request to CDS APP 3. CDS APP sends HTML answer back 4. Display HTML in local system	1. Enter the Data in self-made input mask of local system 2. Local system sends a request to CDS API 3. CDS API sends structured data back 4. Display structured data in self-made GUI in local system

For option 1 see the document Integration Specification Documedis Medication (<https://www.hcisolutions.ch/de/support/dokumentationen/manuals.php>). The details of the integration of option 2 is described in chapter 4.5 Integration APP (UI) and of option 3 in chapter 4.6 Integration API.

4.2 The CDS Med Check types

In the table below you can find all currently available Med Check types, their icons and descriptions. Since not every check needs the same input data, you can find the minimal input data in the last column. There are also references to the CHMED object.

Using our check icon in case of an integration is mandatory, due to safety and risk reasons. The icons are available for free to use as SVG, PNG (40x40) and ICO (16/24/32) files through the following link: https://documedis.hcisolutions.ch/resources/CDS_2021-01.zip

Icon	Check Type	Description	Minimal input data
	allergyExcipient	This check verifies whether a drug excipient matches a patient's documented allergy (or intolerance).	Medication data: - At least one drug Patient data: - The patient's allergies (CHMED RiskCategory 6: Allergies)
	allergySubstance	This check warns if there is a match of a drug substance with a documented allergy of the patient. Cross allergies are also considered.	Medication data: - At least one drug Patient data: - The patient's allergies (CHMED RiskCategory 6: Allergies)
	doping	This check verifies whether the drug may be taken before or during a competition. Concretely, it is checked whether a drug from the medication is present on the doping list.	Medication data: - At least one drug Patient data: - Competitive athlete (CHMED RiskCategory 4, risk id 580)
	doubleMedication	This check verifies whether the medication contains a certain active ingredient in more than one systemically acting drug.	Medication data: - At least one drug Patient data: - No patient data needed
	driving	This check verifies whether a drug has an influence on driving ability or on the ability to operate machines.	Medication data: - At least one drug Patient data: - Driver (CHMED RiskCategory 5, risk id 615)
	elderly	This check verifies whether you should exercise caution with a drug if the patient is older than 65 years.	Medication data: - At least one drug Patient data: - Date of birth (patient must be older than 65 years)

Icon	Check Type	Description	Minimal input data
	interaction	This check checks for the presence of drug-drug interactions.	Medication data: - At least one drug Patient data: - No patient data needed
	interactionFlycycleCH	The Flycycle CH visualizes and evaluates interactions between drugs. The system does not evaluate interactions in theoretical relationships of two, but additionally considers the time and route of administration. Furthermore, it also considers that interactions can be altered in the presence of a third or fourth drug (triplet and quadruplet relationships). <i>Only available with hospINDEX, needs a separate subscription option.</i>	Medication data: - At least one drug - Optional: posology Patient data: - No patient data needed
	liverInsufficiency	This check verifies whether a drug may be taken, is contraindicated, or whether a dose adjustment should be considered in case of liver insufficiency.	Medication data: - At least one drug Patient data: - Date of birth (patient must be older than 18 years) - Liver Insufficiency severity (CHMED RiskCategory 2, risk id's 572, 573 or 574)
	nutrition	This check verifies if there is a food interaction in combination with a drug.	Medication data: - At least one drug Patient data: - No patient data needed
	posology	This check examines whether the maximum dose of a drug has been exceeded.	Medication data: - At least one drug - Structured posology of the drugs Patient data: - Date of birth (patient must be older than 18 years)

Icon	Check Type	Description	Minimal input data
			- Weight - Size
	renalInsufficiency	This check verifies whether a drug may be taken, is contraindicated, or whether a dose adjustment should be considered in case of renal insufficiency.	Medication data: - At least one drug Patient data: - Date of birth (patient must be older than 18 years) - Renal Insufficiency severity (CHMED RiskCategory 1, risk id's 597, 575 or 576, 577)
	reproduction	This check verifies the risks for women of childbearing age and for pregnant and breastfeeding women when taking medicines.	Medication data: - At least one drug Patient data: - Gender (must be a women) - Date of birth - Reproduction risk (CHMED RiskCategory 3, risk id's 612, 77, 78) - If women is pregnant (risk id 78) the date of the last menstruation is also needed
	diabetes	This check verifies whether taking the drug is a risk for diabetics type 1 or 2.	Medication data: - At least one drug Patient data: - Date of birth (patient must be older than 18 years) - Diabetes risk (CHMED RiskCategory 7, risk id's 779, 780)

4.3 The CDS Med Check relevancies

Each CDS risk for a product is encoded with a **relevance code** and an associated icon. This tells the user how grave the risk is and how he should adapt the treatment. In addition, each risk also features additional detail information.

The **hideAbove** value defines the display/sort priority and is also used in the "hideAbove" variable of the API calls. You will need this, if you have to decide which relevance shall be displayed first or to set the threshold for the filter function. Please be aware, that you cannot set a general hideAbove lower than 400 and for liver and renal insufficiency this value cannot be under 510.

Using our icons for showing the relevance is mandatory, due to safety and risk reasons. The icons are available for free to use as SVG, PNG (40x40) and ICO (16/24/32) files through the following link: https://documedis.hcisolutions.ch/resources/CDS_2021-01.zip

On the following page you can find all the icons, their descriptions, relevance codes and hideAboves values.

	Icon	Description The exact description depends on the risk types involved.	relevance code	hide Above
Not filterable	Technical problem			
		Service not available. Due to technical reasons, this check is not available.	500	0
	High risks			
		Stop! Contraindication! One or more of the data sources explicitly mention an absolute contraindication of the product for this risk type!	1	100
		Caution! Major risk! One or more of the data sources explicitly mention a relative contraindication of the product for this risk type.	2	200
	Potential risks			
		Stop! Not enough input! The data sources for this product contain a relevant check, but the patient data is incomplete due to missing risk parameters. Please complete your patient data.	-1	300
filterable		Caution! No data available! The data sources of this product is not available for this risk, therefore no automatic check is possible.	0	400
	Medium and low risks			
		Caution: Known risk. One or more of the data sources explicitly mention a light relative contraindication of the product for this risk type.	3 4 5	500 510 520
		No information. The data sources explicitly contain no information about this risk type for the product.	6	600
		Conflicting scientific results. The data sources contain conflicting information about this risk type of the product (only for check "interactionFlycycleCH")	70	700
	No risks			
		No Risk known. None of the data sources used by the medical editors at HCl mention any kind of risk of this type.	99	800
	Nothing to display	Not applicable (n/a). This product is not relevant for this CDS check.	100	1000
	Nothing to display	Above threshold. The check resulted in a risk above the desired display priority.	null	null
	Other Icons			
		Not transmitted products This icon can be used in your software for labelling the products that have not been transmitted to the CDS check.	-	-

4.4 Request in general

The following headers must be sent for any request to CDS Check:

Key	Content
Authorization* (When used as Header field) access_token (When used as Form parameter)	Bearer token, e.g. "Bearer yourBase64TokenReceivedFromHCI"
Accept-Language	Content language (string, de-CH / fr-CH). All data is available in German or French only. If no such header is provided, the API defaults to German content. For French, put "fr-CH". When calling the APP, this can also be part of the URL route (see 4.5.1)
HCI-CustomerId*	The GLN of the software's end-user or organization
HCI-Index*	The INDEX variant that shall be used by the service (e.g. "hospINDEX"). Casing is irrelevant.
HCI-SoftwareOrgId*	GLN or HCI's customer ID of the software provider. Will be provided together with the token.
HCI-SoftwareOrg*	The name of the manufacturer of the application (e.g. "YourCompany GmbH") [base64]
HCI-Software*	The name of the application instance / installation that is calling the HCI services.
HCI-UserId	The validated GLN of the HealthCareProfessional or the validated (!) Swiss-Rx-Login of the user of your system or the internal identifier of the user in the system described in the HCI-Software field. For personalized functions (e.g. 7601001234567 or maxmiller@insel.ch or mm63) [base64]
HCI-UserName	Display name of the user (e.g. "Max Miller") [base64]

* Indicates that the header is **mandatory** and must not be empty.

The header field values must use ASCII encoding according to the standard. Excluded are the few custom "HCI-*" fields that optionally also accept [base64] encoding; these must use UTF-16 (Windows/.NET default).

Use the base64 encoding if your values can contain characters outside the ASCII range, such as umlauts. In such a case, provide the base64-string inside square brackets (ASCII 91 for "[" and ASCII 93 for "]") as value.

4.5 Integration APP (UI)

Integration of the CDS application allows to obtain a visualization of the CDS check. This visualization exists in 2 formats: Single Page Application (SPA/HTML) or PDF. The 'Accept' header specifies the desired variant.

4.5.1 Request Structure

Headers

Key	Values	Content
Accept	text/html or application/pdf	The format of the CDS check response, HTML or PDF

Payload

	Type	Values	Content
medication*	string	CHMED16A...	CHMED-string of the patient medication
checks	List	Configuration of checks	Default / if empty or missing: all risks / all levels
check*	string	e.g. interaction	Check Type, see table on 4.2
hideAbove*	int	e.g. 400	The highest risk display level to display (see 0). Use this to minimize overalerting. If the value is set, the check returns a relevance "rlv" result of null/empty for the selected check type; it will therefore hide all risks lower than the threshold defined by this value. Allowed values: >= 400, not permitted to be lower. >= 500 for liver and renal insufficiencies. Default / if empty or missing: all levels
printModes	list	check, product	If one or both of the allowed values are included in the request, the HTML UI will show a "Print"-Button that allows the printout of the CDS result in different layouts (see chapter 6.5.3 response)
helpUrl	string	"default"	With a value of "default", a help button is displayed in the top right corner of the app. If empty the "help" button is not shown.

* Indicates that the header is **mandatory** and must not be empty.

It is possible to send various parameters in the URL instead of in a field. The URL can be built up as follows:

Template: {baseAppUrl}/{culture}/{check|printMode}

- baseAppUrl : e.g. for integration <https://int.ce.documedis.hcisolutions.ch/cds/2021-01/app>
- culture (optional) : 'fr-CH' or 'de-CH'. If not specified, CDS will take the default language specified in browser. You can alternatively define it in the 'Accept-Language' header.
- check|printMode (optional):
 - SPA / HTML : the Check Type, must be one defined in the check list of the payload
 - PDF :
 - 'check' : if you want the pdf document grouped by check
 - 'product' : if you want the document grouped by medicament

Here are some examples with the integration environment:

- You want to call the interactions directly:
<https://int.ce.documedis.hcisolutions.ch/cds/2021-01/app/interaction>
- You want to get the PDF grouped by product:
<https://int.ce.documedis.hcisolutions.ch/cds/2021-01/app/product>
- You want to display the check in French:
<https://int.ce.documedis.hcisolutions.ch/cds/2021-01/app/fr-CH>

4.5.2 Request Example

```
{
  "medication":
    "CHMED16A1H4sIAAAAAAAC72VTY/aMBCG/8rK10I3NvmA3EojtqiWjQjdQysOIZklUYIdOU41ivLfdxwD3dMiKELCYvJ6
    PH7mVWLvSRirHLgi/p5MnuMteJ8EQsakR2aHxycZr0GiMA4wjDCR7fQp7bMBSk/AU5zzWY9ESgLoBJR/5ZUJvuZqZ6IZ32
    CQAozhJrgujOEcUurlzMKvVHLjRQglb4ls9skiI/3tPpphitZ0TOCij6lJndZSYkRzPPkn0II28kzQ4Bu4xna7aISaI626b
    5a6CbuVLXCLISLf3k+fYEdNLzTQ7TlPXOc3TdtW2XS95gpZxZQrqzcjIptTGzGlgCtjYnzDzgZpIgZ0SZtFh32L4w8RALY
    XxYcoXUhdGBJhvfBZ6FIf+x9Gxm+1JtPyO6ctis6i1hZFIlxI4Rz+xVRGjFP7QIVRdtahZm7LP6zBOCs1/sIZQiw3drRP/
    5n3HeoY3gEpCXefict6BPdWfWnHZaMykWSpbJLi8RvIvle4PBwOb4pNz2JP+SsU6hqPqUVtj3r3dTmMZZHzWvCHxwesOE
    p8QUrYXA5vj9yboL/Dlm5/gD5v6gLKPyDrKua8wWPvcsdvBK39Po6P/X5BXCWqlytxHXbT9+M8r/7uZLZT2bapLwemzPPc
    OxNH15/KWCuc5FCmmkw/REkGW73S3JynG6vrCrUveDSzqLup/3WwtJhPqc8GnzCw9NGz2OIWOHovs3F3RbdvfmCmRgwIAA
    A=",
  "checks": [
    {
      "check": "AllergyExcipient",
      "hideAbove": 400
    },
    {
      "check": "AllergySubstance",
      "hideAbove": 400
    },
    {
      "check": "interaction",
      "hideAbove": 400
    },
    {
      "check": "nutrition",
      "hideAbove": 400
    },
    {
      "check": "elderly",
      "hideAbove": 400
    },
    {
      "check": "reproduction"
    }
  ],
  "printModes" : [
    "check",
    "product"
  ],
  "helpUrl" : "Default"
}
```

4.5.3 Response

The answer is simply a full working html page which can be displayed in a browser or a pdf file depending on the value of the 'Accept' header.

Mia Graber 02.04.1991

Hilfe
Drucken

Filter ☐ ON

Übersicht

Ventolin Dosieraeros 100 mcg Salbutamol	✓	!	✓
Dafalgan Filmtabl 1 g Paracetamol	✓	!	✗
Demogripal C Gran Ascorbinsäure (Vitamin C, E300), Paracetamol	✓	!	?
Vi-De 3 Tropfen 4500 IE/ml Cholecalciferol (Vitamin D3)	✓		
Roaccutan Kaps 20 mg Isotretinoin	✓		✗

Protokoll

Arzneimittel-Interaktionen

Check durchgeführt
Status: Keine Interaktion in der INDEX-Datenbank hinterlegt. Bitte Fachinformation beachten.
Quelle: Fachinformation / Literatur

Wirkstoff-Allergien

Check durchgeführt
Status: Keine Wirkstoff-Allergie gefunden
Quelle: Fachinformation / ABDA

Hilfsstoff-Allergien

Check durchgeführt
Status: Keine Hilfsstoff-Allergie gefunden
Quelle: Fachinformation / ABDA

Figure 4 Example html page

Fahrtüchtigkeit	
Potenzial der Fährlichkeit: einen Situation ausgesetzt, wie beispielweise dem Führen von Fahrzeugen, dem Bedienen von Maschinen oder dem Arbeiten in grossen Höhen	
✓ Ventolin-Dosieraerosol 100 µg Salbutamol	0: Kein oder vernachlässigbarer Einfluss auf die Fahrtüchtigkeit oder die Fähigkeit Maschinen zu bedienen
✓ Dafalgan Primial 1 g Paracetamol	0: Kein oder vernachlässigbarer Einfluss auf die Fahrtüchtigkeit oder die Fähigkeit Maschinen zu bedienen
✓ Demogripal C Gran Acetaminophen (Paracetamol) 330mg, Paracetamol	0: Kein oder vernachlässigbarer Einfluss auf die Fahrtüchtigkeit oder die Fähigkeit Maschinen zu bedienen
✓ Vi-Die 3 Tropfen 4500 IE/ml Cholecalciferol (Vitamin D3)	0: Kein oder vernachlässigbarer Einfluss auf die Fahrtüchtigkeit oder die Fähigkeit Maschinen zu bedienen
⚠️ Roaccutan Kaps 20 mg isotretinoin	III: Kleiner Einfluss auf die Fahrtüchtigkeit oder die Fähigkeit Maschinen zu bedienen

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Figure 5 Example pdf "check"

Dafalgan Filmtablet 1 g	
✓ Arzneimittel-Interaktionen	Keine Interaktion in der INDEX-Datenbank hinterlegt. Bitte Fachinformation beachten.
✓ Wirkstoff Allergien	Keine Wirkstoff Allergien gefunden
✓ Hilfsstoff Allergien	Keine Hilfsstoff Allergien gefunden
⚠️ Doppel-Medikation	• Demogripal C Gran
✗ Maximal-Dosierung	1-1-2 Stück / Einzelgabe überschritten
👤 Reproduktion	Frauen im gebärfähigen Alter: keine Anwendungsempfehlung der Firma mitgeteilt
✓ Dosing	Nicht auf die Copyrightseite gefunden
✓ Nahrungsmittel-Interaktionen	Keine Interaktion in der INDEX-Datenbank hinterlegt. Bitte Fachinformation beachten.
✓ Fahrtüchtigkeit	0: Kein oder vernachlässigbarer Einfluss auf die Fahrtüchtigkeit oder die Fähigkeit Maschinen zu bedienen

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Figure 6 Example pdf "medicament"

4.6 Integration API

The API offers two levels of detail for the CDS check.

- Summarized: The CDS response in this case is rather compact, it is typically used for the implementation of a "traffic light system". This check could be used to display a single icon as a check result summary, perhaps with some additional tooltip information.
- Detailed: The response contains all details of the CDS check. This response can be used to build a graphical interface with the detailed check information. It is this route that our application uses to build the PDF or SPA.

Both methods use the same algorithm, only the resulting JSON response is different. We strongly suggested to only use the summarized check, then take that response to display the CDS check result in general and to proceed to the APP to display the check result detail. This way, you can take full advantage of the CDS.CE module of Documedis. You may choose to implement your own GUI using the detailed check.

The choice of the variant is made by the URL of the endpoint:

- Summarized: {baseApiUrl}/checks/summarized
- Detailed: {baseApiUrl}/checks/detailed

4.6.1 Request Structure

Headers

Key	Values	Content
Accept	application/json	The only format supported by the API

Payload

	Type	Values	Content
medication*	string	CHMED16A...	CHMED-string of the patient medication
checks	List	Configuration of checks	Default / if empty or missing: all risks / all levels
check*	string	e.g. interaction	Check Type, see table on 4.2
hideAbove*	int	e.g. 400	The highest risk display level to display (see 0). Use this to minimize overalerting. If the value is set, the check returns a relevance "rlv" result of null/empty for the selected check type; it will therefore hide all risks lower than the threshold defined by this value. Allowed values: >= 400, not permitted to be lower. >= 500 for liver and renal insufficiencies. Default / if empty or missing: all levels

* Indicates that the header is **mandatory** and must not be empty.

Please note that the construction of the body is identical to that of the app (4.5.1). The second part is strictly reserved for display, it is not necessary for the call to the API.

4.6.2 Request Example

```
{
  "medication":
  "CHMED16A1H4sIAAAAAAAC72VTY/aMBCG/8rK10I3NvmA3EojtqiWjQjdQysOIZklUYIdOU41ivLfdxwD3dMiKELCYvJ6
  PH7mVWLvSRirHLgi/p5MnuMtEJ8EQsakR2aHxycZr0GiMA4wjdcR7fQp7bMBSk/AU5zzWY9ESgLoBJR/5ZUJvuZqZ6IZ32
  CQAozhJrgujOEcurLzMKvVHLjRQglb4ls9skiI/3tPpphitZ0TOCij6lJndZSYkRzPPkn0II28kzQ4Bu4xna7a1SaI626b
  5a6CbuVLXCLISL3k+fYEdNLzTQ7TlPXOc3TdtW2XS95gpZxZQrzcjIptTGzG1qCtjYnzDzgZpIgZ0SZtFh32L4w8RALY
  XxYcoXUHDGBJhvfBz6FIf+x9Gxm+1JtPyO6ctis6ilhzFI1xI4Rz+xVRGjFP7QIVRdtahZm7LP6zBOCs1/sIZQiw3drpP/
  5n3HeoY3gEpCXefict6BPdWfWnHZaMykWSpbJLi8RvIvle4PBwOb4pNz2JP+SsU6hqPqUVtj3r3dTmMZHzWvCHxwesoE
  p8QURyXA5vj9yboL/D1m5/gD5v6gLPyDrKua8wWPvcsdvBK39Po6P/X5BXCWq1ytXHXbT9+M8r/7uZLZT2bapLwemzPPc
  OxNH15/KWCuc5FCmmkw/REkGW73S3JynG6vrCrUveDSzqLup/3WwtJhPqc8GnzCw9NGz2OIWOHovs3F3RbdvfmCmRgwIAA
  A=",
  "checks": [
    {
      "check": "AllergyExcipient",
      "hideAbove": 400
    },
    {
      "check": "AllergySubstance",
      "hideAbove": 400
    },
    {
      "check": "interaction",
      "hideAbove": 400
    },
    {
      "check": "nutrition",
      "hideAbove": 400
    },
    {
      "check": "elderly",
      "hideAbove": 400
    },
    {
      "check": "reproduction"
    }
  ]
}
```


- The CDS Med Check relevancies".
- A result perspective based on each *MedicationItem* of the patient. A list of medications and their risks.
- A result perspective based on each *Check* type. A list of check and their risks.

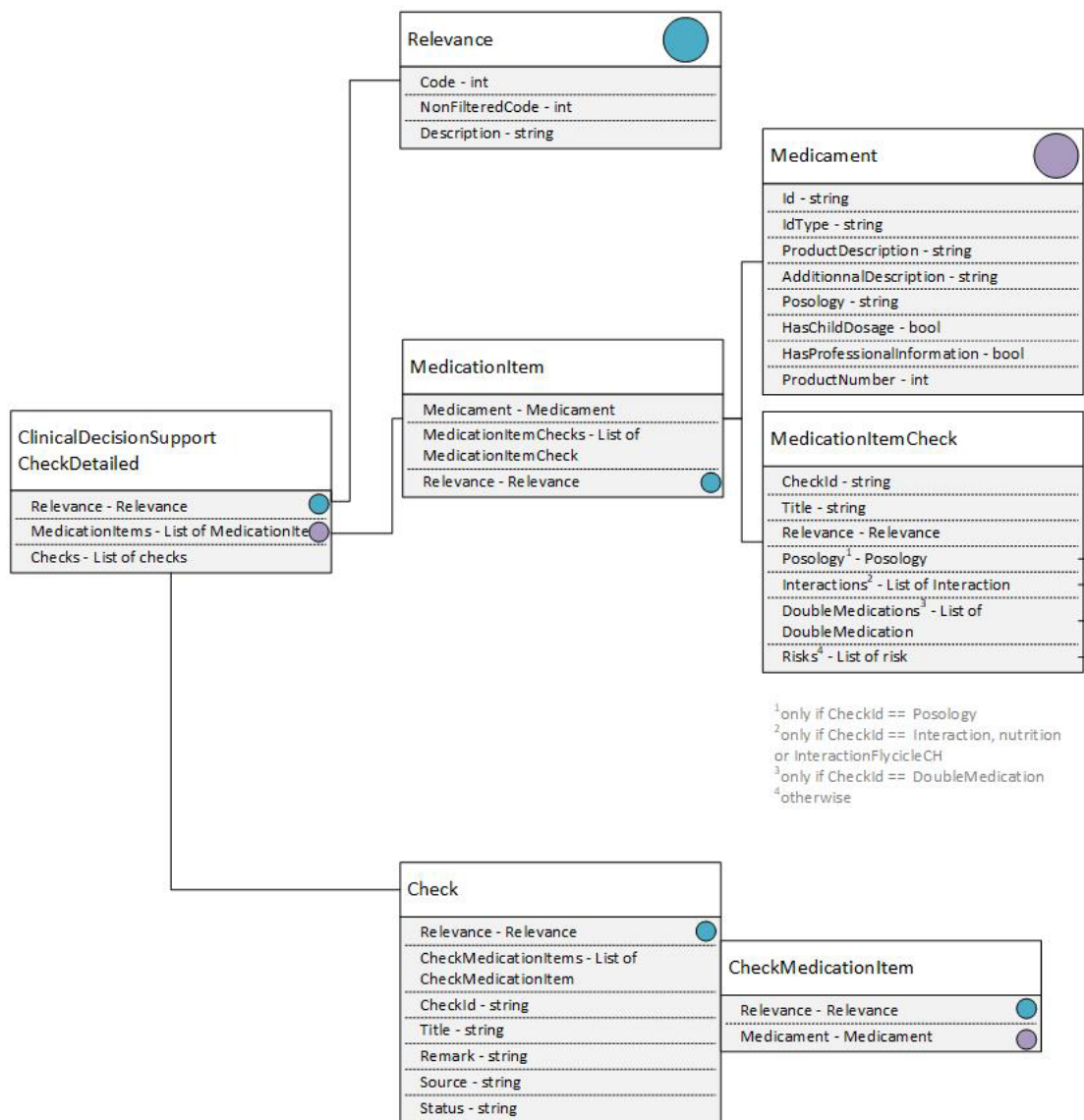


Figure 8 API Detailed Result - left side

Going into the details of the left part of the diagram:

The *Relevance* consists of:

- a result code based on the hideAbove filter provided;
- a nonfiltered "true" result code and
- the description of the Relevance in the language of the Accept-Language header field of the request.

Each *MedicationItem* consists of :

- The Relevance [] of this MedicationItem;

- The Medicament [] used in this MedicationItem. The id and description of the drug product itself;
- The various MedicationItemChecks that were performed for this MedicationItem. This is a list of all the checks that were done for this item based on the data available for this product and the risks of the patient.
The availability of some of these properties depends on the type of the check: The Posology object is only available for this check, and the same goes for Interactions and DoubleMedications. In all other cases, the details are in the generic list of risks. Details about these specific properties can be found on the next page.

Each *Check* consists of:

- The Relevance [] of this Check;
- The various CheckMedicationItems used in this Check. This is a list of all Medicaments and their Relevance relevant to this Check;
- Various details about the Check.

The *Relevance* object is also re-used in many of the check details [].

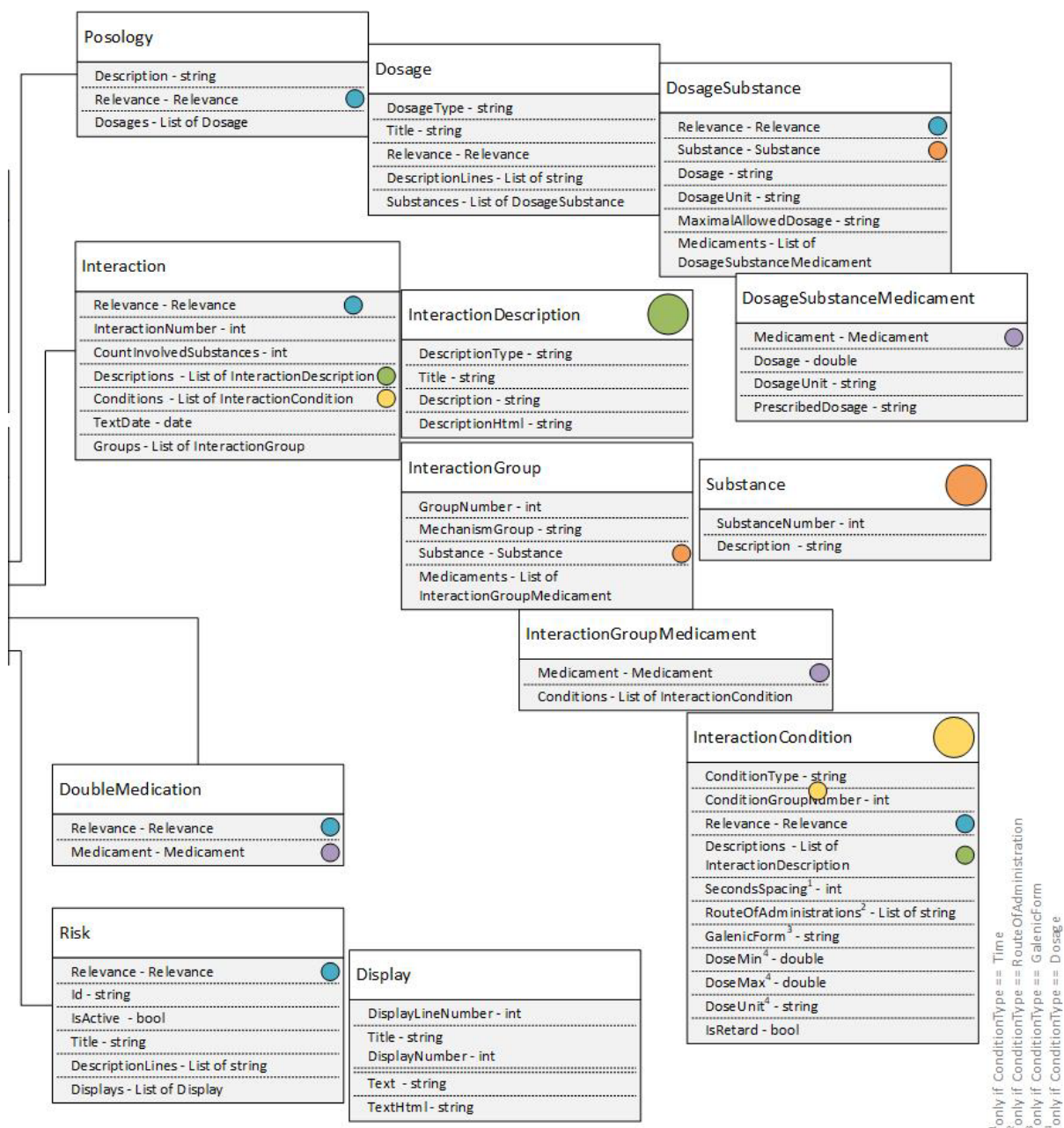


Figure 9 API Detailed Result - right side

Going into the details of the right part of the diagram:

As described above, each *MedicationItemCheck* can have slightly different properties, depending on the exact type of the check itself.

For the *Posology* check result:

- The Posology with a list of all Dosages checked
 - With a list of the relevant individual *DosageSubstances*
 - As defined by the *Substance* according to a list of all *DosageSubstanceMedicaments*
 - which consists of each *Medicament* and its dosage.

For the *Interaction* check results:

- A list of all Interactions, with the details for each:
 - The causing and the reacting substance mechanisms as a lists of *InteractionGroups*, the list of interaction descriptions and the list of conditions
 - For each *InteractionGroup*, the *Substance* [] and the list of *InteractionGroupMedicaments* with that substance
 - For each *Substance*, its id and description.
 - For each *InteractionGroupMedicaments*, its medicament and the list of condition in which the interaction is relevant
 - For each interaction description, the type of description and the attributes of this description (title, description, descriptionHtml (same as description but with html formatting tags))

For a *DoubleMedication* check result:

- A list of all DoubleMedications, with the details of each:
 - The *Relevance* for each *Medicament* with that risk.

For any other type of *Risk* check result:

- A list of all Risks, with the details of each.

4.7 Error Handling

The following errors could be returned by the CDS Service:

Error	Description
Unauthorized (401)	Your request has been rejected because you are not authorized to used the service. Please check your token and HCI Headers (please refer to 3.5 and 4.4).
Forbidden (403)	You are authenticated but not authorized, please contact the hotline
Unprocessable entity (422)	You request is not valid because of structure of the body or semantic errors. Please pay attention of the description contained in the response body, you should find the error.
Internal Server error (500)	Something does is wrong on our side, please try again and contact us if the problem persists.

4.8 Acceptance Criteria for verification of installation

The following requirements must be met by the primary system provider:

- To ensure, that the warning messages in the primary system are understandable, our icons must be used in an API integration and must be at least 16 pixels in size.
- The checks interaction and doubleMedication may only be activated together.
- The checks allergyExcipient and allergySubstance may only be activated together.
- If Documedis CDS.CE is integrated via API Integration (option 3) the one of the two following criteria must be met:
 - Either all available detailed information must be displayed in the GUI of the primary system
 - or the user must be able to open the Documedis CDS.CE APP (option 2) in order to access all detailed information.
- Furthermore, an acceptance test must be carried out at the end of the integration and before going live.

5 Integration of CDS.CE Vac Check

5.1 Overview

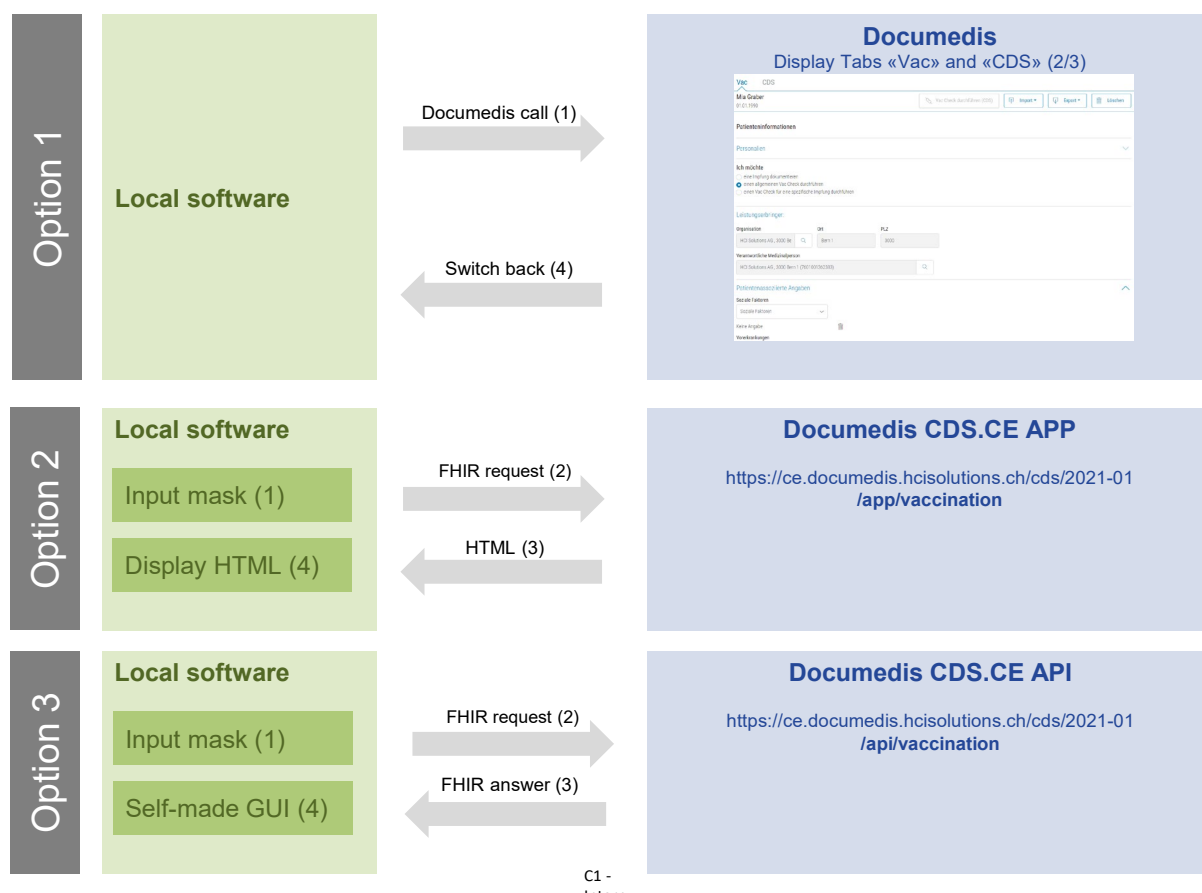


Figure 10 Integration options CDS.CE Vac Check

Option 1	Option 2	Option 3
1. Documedis call with the tabs «Vac» and «CDS» 2. Enter the data in Documedis in the tab «Vac» 3. Display the results in Documedis in the tab «CDS» 4. If the consultation is finished, switch back to local system	1. Enter the Data in self-made input mask of local system 2. Local system sends a FHIR request to CDS APP 3. CDS APP sends HTML answer back 4. Display HTML in local system	1. Enter the Data in self-made input mask of local system 2. Local system sends a FHIR request to CDS API 3. CDS API sends structured data back 4. Display structured data in self-made GUI in local system

For option 1 see the document Integration Specification Documedis Medication (<https://www.hcisolutions.ch/de/support/dokumentationen/manuals.php>). The details of the integration of option 2 is described in chapter 5.5 and option 3 in chapter 5.6.

5.2 CDS Vac Check status

For each indication the check gives a vaccination status, which shows, if the vaccination is complete, incomplete etc. (see <https://hcisolutions.ch/ig/ig-hci-vacd/site/ValueSet-hci-vacd-cds-vaccination-status-vs.html>)

Using our icons for showing the relevance is mandatory, due to safety and risk reasons. The icons are available for free to use as SVG, PNG (40x40) and ICO (16/24/32) files through the following link: https://documedis.hcisolutions.ch/resources/CDS_2021-01.zip

Status	Description	Code
Vaccination complete	The patient has either received all required vaccine doses or he has a sufficient immunity (e.g., indicated through a high antibody titer).	VC
Vaccination incomplete	The patient has either not received all required vaccine doses or he has a insufficient immunity (e.g., indicated through a low antibody titer).	VIC
Vaccination not received	The patient has not received any vaccine doses.	VNR
Vaccination irrelevant	The vaccine is not relevant for this patient (e.g., because of his age).	VIR
Vaccination not evaluable	The vaccination is not evaluable for example, because of lack of information.	VNE

5.3 CDS Vac Check relevancies

Each risk for a vaccination is encoded with a code and an associated icon. Please be aware, that the meaning of this icons is slightly different from the Med Check relevancies. (see <https://hcisolutions.ch/ig/ig-hci-vacd/site/ValueSet-hci-vacd-cds-relevance-vs.html>)

Using our icons for showing the relevance is mandatory, due to safety and risk reasons. The icons are available for free to use as SVG, PNG (40x40) and ICO (16/24/32) files through the following link: https://documedis.hcisolutions.ch/resources/CDS_2021-01.zip

Icon	Description	Code
	Service not available. Due to technical reasons, this check is not available.	ServiceNotAvailable
	Contraindicated This vaccination is contraindicated for this patient because of a risk factor.	KI
	Consult practitioner A practitioner should be consulted because of a certain risk factor (e.g., pre-existing illness or pregnancy)	CP
	Not relevant If a vaccination is not relevant because of a risk factor.	NR
	Indicated There is no risk in giving the patient this vaccination.	I

5.4 Request in general

The interface is specified in detail in the implementation guide. It is available here:

<https://hcisolutions.ch/ig/ig-hci-vacd/site/index.html>. Here, you will find a summary of the main information without details on the different payloads / responses.

The interface of the Vac Check conforms to FHIR. The payload of a typical Vac Check request looks like this:

```
{
  "hook": "vaccination-check",
  "hookInstance": "0a9acefb-a68a-4067-a686-f622be699278",
  "context": {
    "bundle": "Bundle/CdsGenericFormToCdsRequestMessageBundle"
  },
  "prefetch": {
    "bundle": <--- prefetched Bundle resource goes here
  }
}
```

The *bundle* must follow the requirements according to the profile CH VACD Message Immunization Recommendation Request : <https://fhir.ch/ig/ch-vacd/StructureDefinition-ch-vacd-recommendation-request-message.html>.

Additionally, the following headers must be sent for any request to CDS Check.

Key	Type
Authorization* (When used as Header field) access_token (When used as Form parameter)	Bearer token, e.g. "Bearer yourBase64TokenReceivedFromHCI"
HCI-CustomerId*	The GLN of the software's end-user or organization
HCI-Index*	The INDEX variant that shall be used by the service (e.g. "hospINDEX"). Casing is irrelevant.
HCI-SoftwareOrgId*	GLN or HCI's customer ID of the software provider. Will be provided together with the token.
HCI-SoftwareOrg*	The name of the manufacturer of the application (e.g. "YourCompany GmbH") [base64]
HCI-Software*	The name of the application instance / installation that is calling the HCI services.
HCI-UserId	The validated GLN of the HealthCareProfessional or the validated (!) Swiss-Rx-Login of the user of your system or the internal identifier of the user in the system described in the HCI-Software field. For personalized functions (e.g. 7601001234567 or maxmiller@insel.ch or mm63) [base64]
HCI-UserName	Display name of the user (e.g. "Max Miller") [base64]

* Indicates that the header is **mandatory** and must not be empty.

The header field values must use ASCII encoding according to the standard. Exempt are the few custom "HCI-*" fields that optionally also accept [base64] encoding; these must use UTF-16 (Windows/.NET default). Use the base64 encoding if your values can contain characters outside the ASCII range, such as umlauts. In such a case, provide the base64-string inside square brackets (ASCII 91 for "[" and ASCII 93 for "]") as value.

The language can be set in the bundle:

Name	Flags	Card.	Type
Bundle	C	0..*	Bundle
id	Σ	0..1	id
meta	Σ	0..1	Meta
implicitRules	?! Σ	0..1	uri
language		0..1	code

5.5 Integration APP (UI)

5.5.1 Request Structure

Headers

Key	Values	Content
Accept	text/html or application/pdf	The format of the CDS Vac check response, HTML or PDF

Please refer to '5.4 Request in general'

5.5.2 Response

The answer is simply a full working html page which can be displayed in a browser or a pdf file dependent of the value of the 'Accept' header.

Impfstatus für FSME				
Impfungen für Risikogruppen				
Impfung unvollständig FSME				
Impfempfehlung für FSME				
Impfung	Relevanz	Beeinflussende Faktoren	Impfschema	Zusatzinformationen
FSME	indiziert	Wohnort oder Aufenthalt ganze CH ausser Genf und Tessin (für FSME)	1. Dosis: erhalten (ENCEPUR N) (03.05.1999) 2. Dosis: So bald wie möglich 3. Dosis: 9 Monate nach der 2. Dosis (Mindestabstand 8 Monate zur letzten Dosis) Zyklus: Alle 10 Jahre	Dieses Schema gilt für die Impfung mit dem Impfstoff Encepur. Für die Schnellschemata siehe Fachinformationen.

Figure 11 Example html result of a specific check

Impfplan

Melissa Hofer (01.02.1979)

1 Erhaltene Impfungen

Datum	Impfstoff	Diphtherie	Tetanus	Pertussis	Hämophilus Influenzae Typ B	Pneumokokken	Polio	Masern	Mumps	Röteln	Varizellen	HPV	Influenza	Hepatitis A	Hepatitis B	Meningokokken	Herpes Zoster	FSME	Tollwut
15.07.2016	MENVEO																		
19.12.2015	ENCEPUR N																		
19.12.2015	HAVRIX 1440																		
14.03.2015	ENCEPUR N																		
05.02.2015	ENCEPUR N																		
11.05.2002	HBVAXPRO 10																		
17.11.2001	HBVAXPRO 10																		
30.09.2001	HBVAXPRO 10																		
30.09.2001	MMRVAXPRO																		
28.08.2001	MMRVAXPRO																		
Alle Impfungen gegen DTPa in der Kindheit erhalten																			
Alle Impfungen gegen Polio in der Kindheit erhalten																			

2 Impfeempfehlung

Impfung	Impfschema
Diphtherie	Alle Impfungen gegen DTPa in der Kindheit erhalten 1. Dosis: So bald wie möglich 2. Dosis: 20 Jahre nach der 1. Dosis (Mindestabstand 4 Wochen zur letzten Dosis) 3. Dosis: 10 Jahre nach der 2. Dosis (Mindestabstand 4 Wochen zur letzten Dosis) Zyklus: Alle 10 Jahre (Mindestabstand 1 Monat zur letzten Dosis)
Influenza	1. Dosis: So bald wie möglich Zyklus: Jährlich

3 Stempel und Unterschrift des Erstellers

Ort / Datum	Stempel und Unterschrift des Erstellers
.....	

Melissa Hofer

Stand 24.10.2022

HCI Solutions AG 1/1

Figure 12 Example pdf for a generic check

5.6 Integration API

5.6.1 Request

Headers

Key	Values	Content
Accept	application/json+fhir	The only format supported by the API

Please refer to '5.4 Request in general'

5.6.2 Response

The response will follow this structure:

```

{
  "cards": [
  ],
  "systemActions": [
  ]
}

```

For more details, please refer to the Implementation Guide HCI-VACCD :
https://int.hcisolutions.ch/ig/ig-hci-vacd/site/vaccination_check_response.html.

5.7 Error Handling

The following errors could be returned by the CDS Service:

Error	Description
Unauthorized (401)	Your request has been rejected because you are not authorized to use the service. Please check your token and HCI Headers (please refer to 3.5 and 4.4).
Forbidden (403)	You are authenticated but not authorized, please contact the hotline.
Unprocessable entity (422)	Your request is not valid because of structure of the body or semantic errors. Please pay attention of the description contained in the response body, you should find the error.
Internal Server error (500)	Something is wrong on our side, please try again and contact us if the problem persists.

5.8 Acceptance criteria for verification of installation

The following requirements must be met by the primary system provider:

- If Documedis CDS.CE is integrated via API Integration (option 3) the one of the two following criteria's must be met:
 - Either all available detailed information must be displayed in the GUI of the primary system
 - or the user must be able to open the Documedis CDS.CE APP (option 2) in order to access all detailed information.
- An acceptance test must be carried out at the end of the integration and before going live.

6 Additional Tools

6.1 Swagger API documentation

All routes provided by our CDS API service are described via swagger. You can find this documentation here:

<https://ce.documedis.hcisolutions.ch/cds/2021-01/api/docs/index.html>

It is possible to test directly the calls to the different routes from this interface.

6.2 Examples

You will find a list of curls and self-posted html forms which could help you to implement the interface to our services.

Med Check

- Curls
 - Summarized check
 - Detailed check
 - Print check (PDF), grouped by checks
 - Print check (PDF), grouped by medicaments
- Self post forms
 - Display Med check
 - Display Med check (with interaction tab active by default)

Vac Check

- Curls
 - Generic Check
 - Flu Check (Influenza)
 - Print Check (PDF), Generic Check
- Self post form
 - Display generic check

You will find all these examples here : https://documedis.hcisolutions.ch/resources/CDS_2021-01_Examples.zip

7 Support

Technical and content-related errors or deficiencies in the context of the use of CDS.CE, which are detected by the users or by the software house partner, must be reported to HCI Solutions as soon as possible but within a maximum of two working days via 058 851 26 00 or hotline@hcisolutions.ch after their discovery and preliminary clarification by the IT department of the users or by the software house partner. On weekends and holidays, the on-call number 022 304 62 61 is available. This applies in particular to serious incidents with a reporting obligation in accordance with the Medical Devices Ordinance (MepV).

HCI Solutions keeps a corresponding log of the error/defect reports communicated to it in this way. Prioritization of the error/defect reports is at the discretion of HCI Solutions. The elimination of errors/defects shall be carried out exclusively in coordination with the respective current development planning of HCI Solutions and/or the requirements of the MepV. Any further warranty claims in connection with Documedis CDS.CE do not exist and are hereby excluded.

8 Appendix

8.1 Example eMediplan

If you need some initial example data you can use the fictive test example below. It is not realistic but it includes a large number of medications and all possible risks.

```
CHMED16A1H4sIAAAAAAACr1VTY/aMBD9KytFC1IPPluS7NQJLKNgO5hKw4heCEKOMhxKIHKf
+84hoCqFdkDaqRE9svz5M0bZeZA4kRmjEsSHMjgJdkyEpCwEAnpkPFpOxTJggkE+iHSCPi20wXom
hZCQ8aX+C4wO2QqBWOKgPBttOLr5nc69WYr3CxZLiM1wVXgXH5HCXZr9Hy5IEPw9ktt+xOuBr
ot6AYRmuAYaNtwmW6xkmBXwYjtGz/kRPw+g5pBTlCd4hEVuqPMJxKSPGddhYsC0JaldM0jr8CCK2
7nDj9Oj82NGQoyEXnAYyTyZPbiA4Qb7XQJaGvAvins9BA3lnkj/XOpPrXOGcq68s/cEzdNFUR/+1wn
Wa93CcH491xlmKZeJSB1QfI2A7QH2oPdUhMOG40lxQDkSBjhCTmnaXWlhKJIZyVpzKwCesrA0Lk
U8N2rm6a/VaANllFXVnFYLzX9ZxEmaK2mnrlvA9jtMmiX+l3TaZEBH8uYyhzps3w1KVXfp8VylRjnW
H70vEgQir9fVDbSLNsCeg9pV7JapPU3IVwX6XopqjR//MbE79sSgfZ6vbtqhFaNI/7OcpkVLe4BBdsD
7//6Fyciz3hZ8lfHB4wgN6wsN2zVotT23bvovP4T4KbOqCpztvnFRLLOK+w77V4eSeFysnzfdvJV9Qm
i937Z7Q55I3L3C5O/RhivZfrbVW2qAPT8+7n3efktTUYPBgPMrapp5naTNM12yoakrBdNy2/ToGeru4
Hj/OF556wcyDbcyngRLNc0+qpUfFW4uhVcevBfGnoM4DA8gJwv1Al6gCTLTZmxcRJ0q8n8vEv/CUJ
JvsHAAA=
```

8.2 Example Vac Check Request

https://index.hcisolutions.ch/docs/tec_doc/Vaccination/ExampleCdsVaccinationRequest.json

8.3 Example Vac Check Response

https://index.hcisolutions.ch/docs/tec_doc/Vaccination/ExampleCdsVaccinationResponse.json

9 Marking

Documedis CDS.CE	
MD 1250	
	4.0.2.0
	7649998068CDSRM
	2024-11-06
	HCI Solutions AG Untermattweg 8 3027 Bern Schweiz hotline@hcisolutions.ch Tel. +41 58 851 26 00 https://www.hcisolutions.ch/

10 Version History

Version	Changes	Author
1.0	Initial version release 2021-01	lfl/tst
1.1	Chapter 2 and 6.2.4: Change of the Documedis URL Chapter 3 and 5: Change of the "Documedis Modules" graphics Chapter 4.2: New icon "Not transmitted products" added	lfl/tst
1.2	Chapter 6.1: Small changes Chapter 6.2.1: Note in the helpURL field: If empty the "help" button is not shown Chapter 6.2.3: Explanation of risk ID 613 for reproduction	lfl
2.0	Complete revision	lfl/ccr
2.1	Chapter 5.4: Key «CustomerId» new GLN instead of INDEX-Login number Chapter 5.2: Date of birth as minimal input data reproduction Chapter 5.8: New acceptance criterias	lfl
2.2	Chapter 10: update lot	lfl
2.3	Chapter 10: update lot	lfl
2.4	Chapter 10: update lot	lfl
3.0	Chapter 3.2: Intended purpose adapted Chapter 3.3: added Chapter 3.4: Residual risks updated Chapter: 5.3: changed name from "Display Level" to "hideAbove" Chapter 5.4: Description of fields simplified Chapter 5.5.1: field "targetOrigin" and "Header Stylecolor" deleted and customized helpUrl removed Chapter 5.6.3: Pictures updated Chapter 6.4: Description of field simplified and field "Accept-Language" deleted and information about language added	lfl

Version	Changes	Author
	Chapter 6.5.1: field "Header Stylecolor" deleted Chapter 9.1: example changed Chapter 10: Update marking	
3.1	Design change Chapter 10: Update marking	lfl
3.2	Chapter 10: update lot	aan