



PRISMAPRO

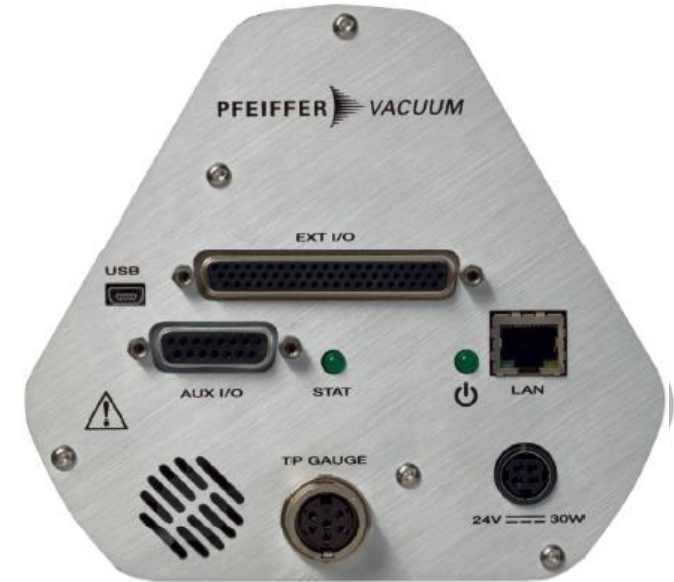
Communication Possibilities

(FW \geq 1.9.0)

Agenda

- 1. Introduction to PrismaPro
- 2. Functionality
- 3. Communication possibilities
- 4. API-Communication
- 5. PV-Cloud
- 6. Applications
- 7. Summary

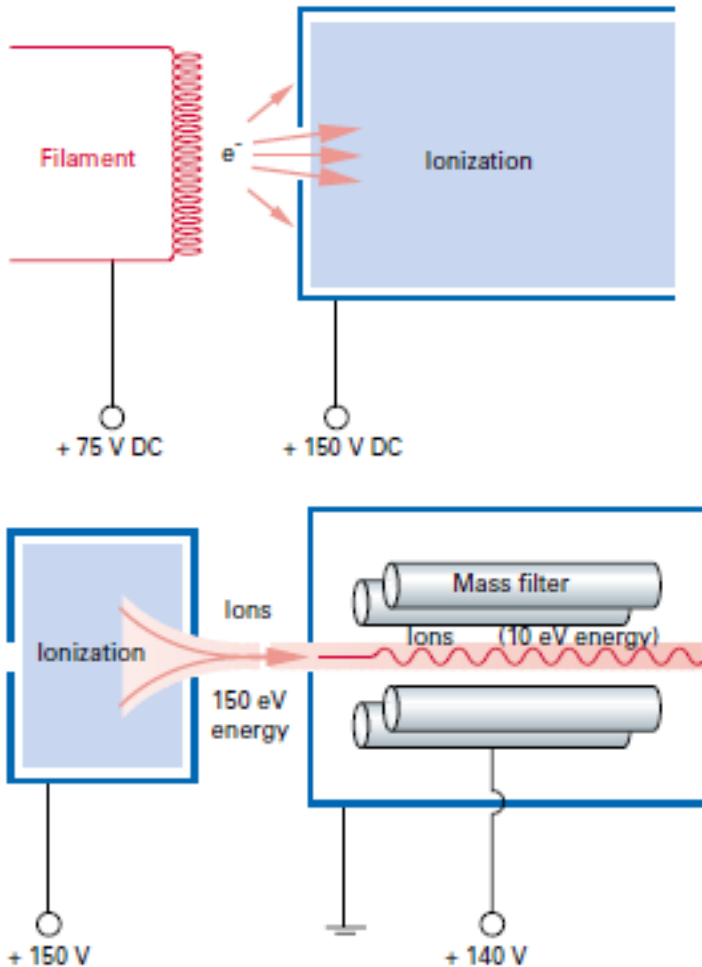
1. Introduction to PrismaPro



Standard: 1x AI, 2x DI, 1 Relay

Extended: 8x AI, 5x DI, 10x DO, 8x AO
1x total Pressure-Transmitter

2. Functionality



The PrismaPro is a quadrupole mass spectrometer.

The neutral gas particles are ionized in an ion source and the ions are separated from each other in a high-frequency electric quadrupole field according to their mass and charge conditions.

The detection of the filtered ions is carried out using Farady Cup or secondary electron multiplier.

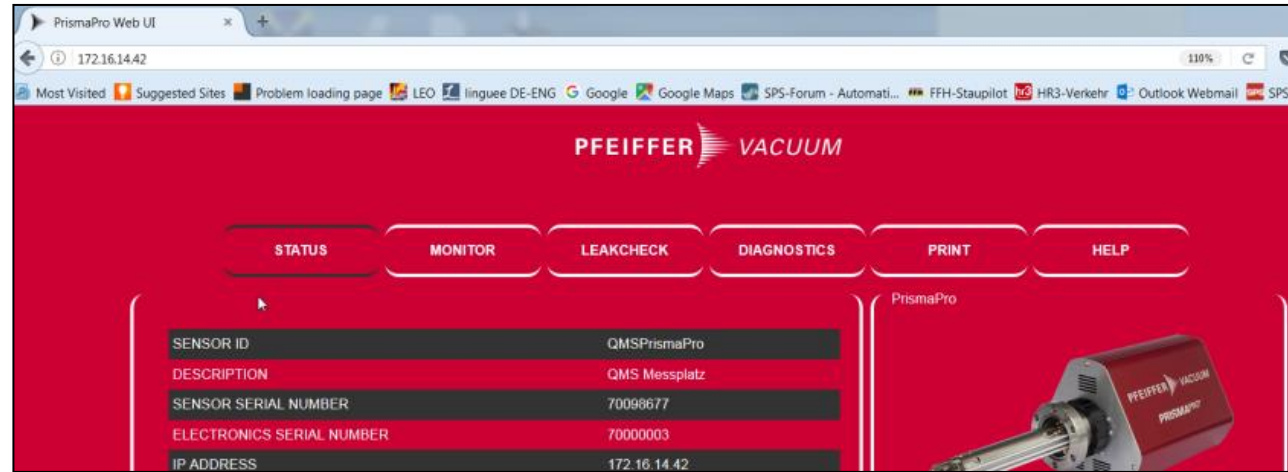
The detected ion flow is proportional to the partial pressure of the respective gas components

We are measuring Ion-Current for adjusted amu

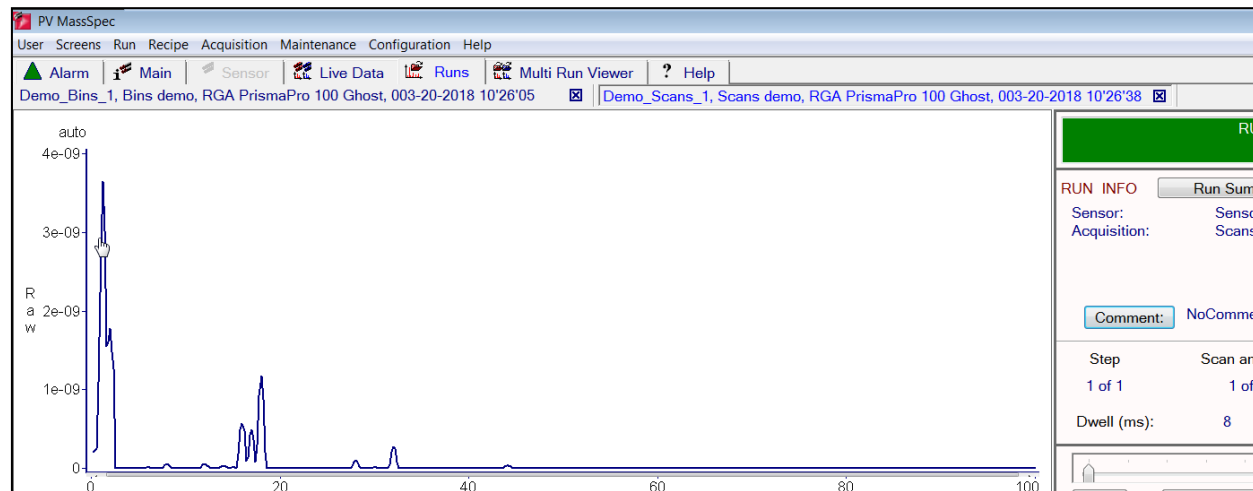
<https://www.youtube.com/watch?v=TrLMNRyQiaA>

3. Communication possibilities

- **WebUI:**
<http://192.168.1.100>



- **PVMassSpec:**
Start exe



3. Communication possibilities

- **MMSP-API:** (Modular Mass Spec - Web-API, http port: 80)
Is a web server, whose API is accessed over HTTP.

API: Application Programming Interface

Is a set of subroutine definitions, protocols and tools for building application software. In general terms, it is a set of clearly defined methods of communication between various software components (*wikipedia*)

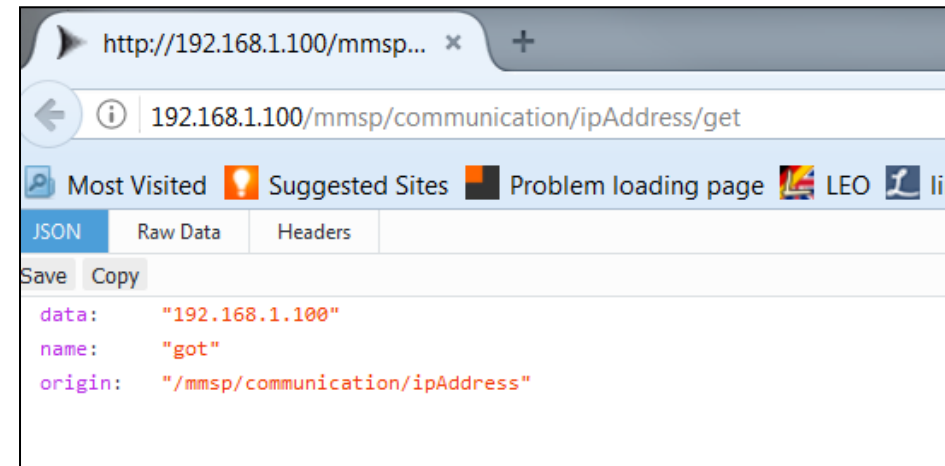
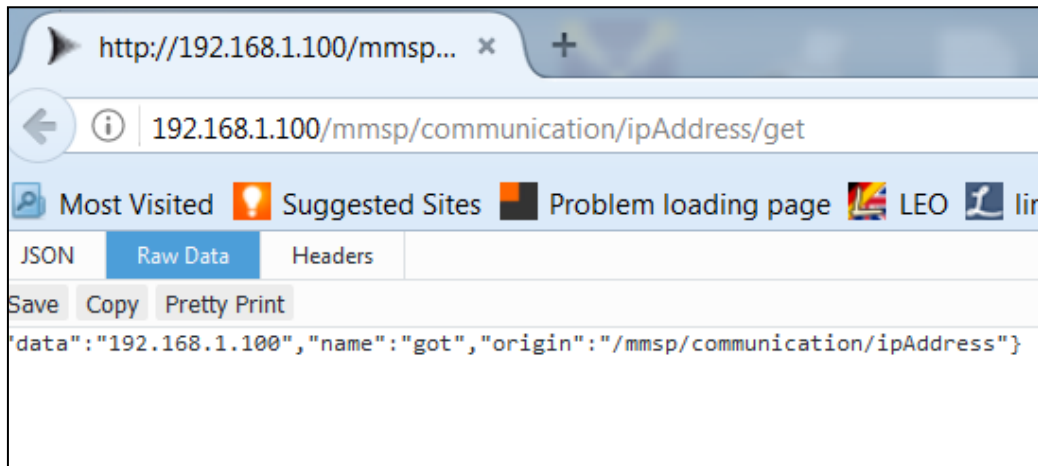
Documentation for the API usually is provided to facilitate usage and Implementation.

https://en.wikipedia.org/wiki/Application_programming_interface

4. API-Communication

■ Web browser input

<http://192.168.1.100/mmsp/Communication/ipAddress/get>



■ cURL (.bat-File)

[API-Get_IP](#)

[API-Set_Sweep](#)

[.txt](#)

cURL is a command line tool for getting or sending files using URL syntax (*wikipedia*)

■ Access/Excel mit VBA

[API-Access](#)

[API-Excel](#)

4. API-Communication

- **JSON** (JavaScript Object Notation)

www.json.org



is an open-standard file format that uses human-readable text to transmit data objects consisting of attribute–value pairs and array data types (*wikipedia*)

It is a syntax analysis necessary (Parsing) to resolve the dataset into his related elements.

Parse JSON:

Raw-Data: `{"data":"192.168.1.100","name":"got","origin":"/mmsp/communication/ipAddress"}`

into:



| | |
|--------|-------------------------------|
| data | 192.168.1.100 |
| name | got |
| origin | /mmsp/communication/ipAddress |

Example 1: MS-Access + VBA: API.accdb



```
Set httpObject = CreateObject(" MSXML2.XMLHTTP ")
```

```
httpObject.Open "GET", "" & "http://" & IPADDRESS & "/mmsp/communication/ipAddress/get", False
```

```
httpObject.Send
```

```
result = httpObject.ResponseText
```

```
MsgBox ("Result of API-Get: " & result)
```

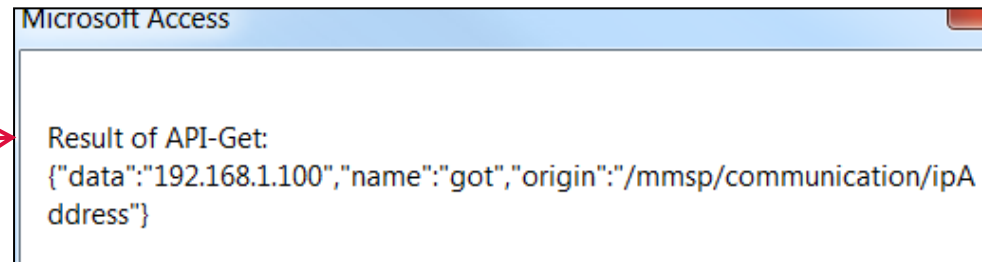
```
Dim JSON As Object
```

```
Set JSON = JsonConverter.ParseJson(result)
```

```
Text3.Value = JSON("data")
```

```
Text6.Value = JSON("name")
```

```
Text8.Value = JSON("origin")
```



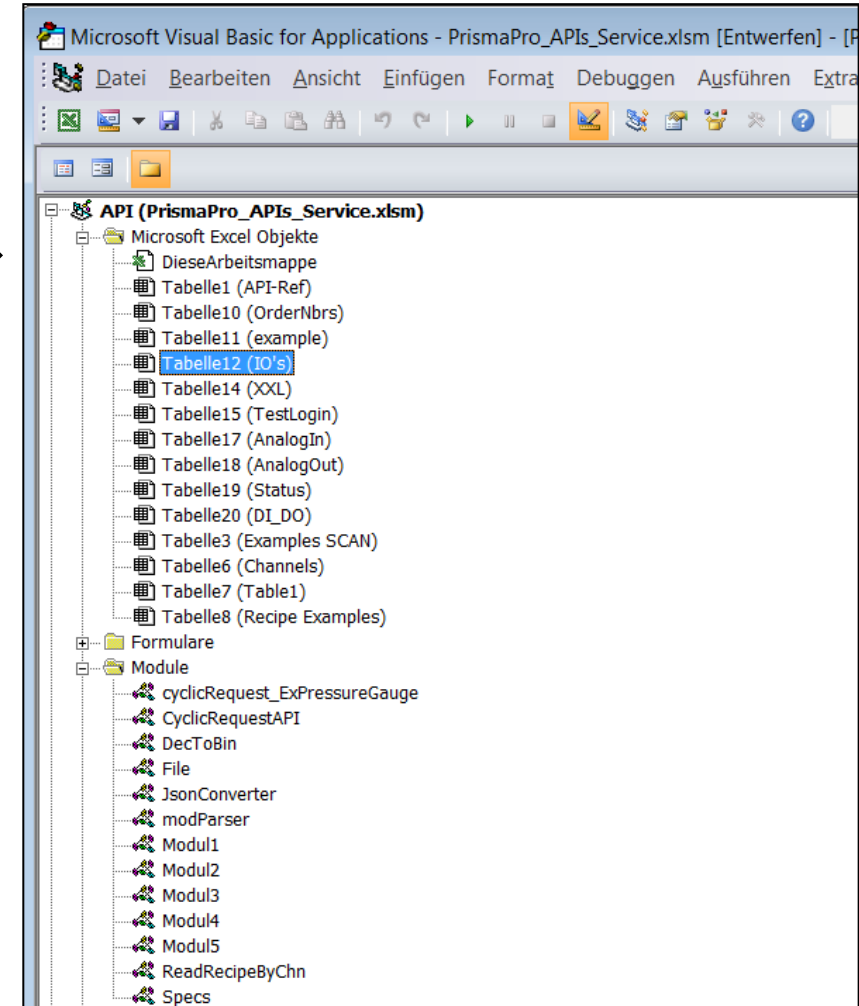
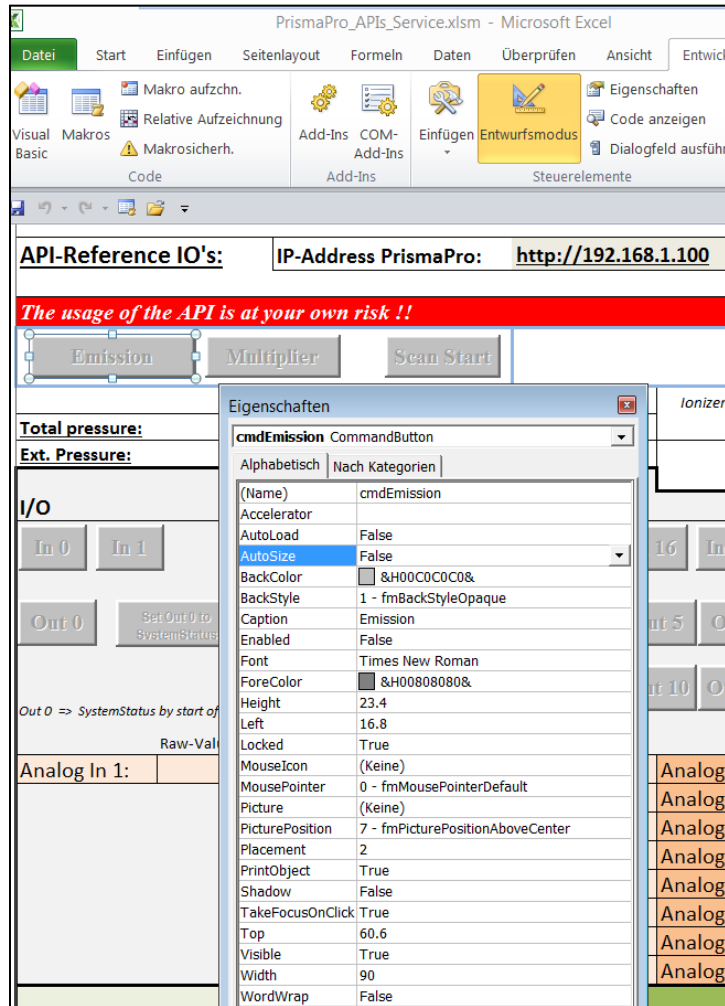
Example 2: MS-Excel:

PrismaPro_API.xlsm

| API-Reference "PrismaPro": FW ≥1.9.0 | | | | | IP-Address PrismaPro: http://192.168.1.100 | <== Select IP-Address!!! | | |
|---------------------------------------------|------------------------|---------|-----------------|-----|-------------------------------------------------------------------------------|--------------------------|---------|---------|
| The usage of the API is at your own risk !! | | | | | API Reference PrismaPro.pdf | User rights / modes | | |
| Nbr | Target | ↓ index | set Value: | ↓ | Title | read | write | execute |
| 1 | mmsp | get - | - | | Modular Mass Spec | | | |
| 2 | <u>electronicsInfo</u> | get - | | | Electronics Information | | | |
| 3 | serialNumber | get - | STMS16064 | set | Serial Number | normal | service | null |
| 4 | monitorFWVersion | get - | - | X | Monitor Firmware Version | normal | null | null |
| 5 | controlFWVersion | get - | - | X | Control Firmware Version | normal | null | null |
| 6 | genus | get - | 4 | set | Genus | normal | admin | null |
| 7 | massRange | get - | - | X | Mass Range | normal | null | null |
| 8 | <u>communication</u> | get - | - | | Communications Port Configuration | | | |
| 9 | ipAddress | get - | 192.168.1.100 | set | IP Address | normal | normal | null |
| 10 | macAddress | get - | 0:A0:41:02:10:4 | set | MMSP MAC Address | normal | admin | null |
| 11 | gateway | get - | 0.0.0.0 | set | MMSP Gateway | normal | normal | null |
| 12 | mask | get - | 255.255.255.0 | | MMSP Mask | normal | normal | null |
| 13 | port | get - | 80 | set | MMSP Port | normal | control | null |

Example 3: MS-Excel + VBA: (Microsoft Excel sheet with Macros)

PrismaPro_API.xlsm



Example 3:

Toggle Emission

```
cmdEmission
Click

Private Sub cmdEmission_Click()
    Dim httpObject As Object
    Dim i As Integer
    Dim IPADDRESS As String
    Dim result As String
    Dim EMISSION As String

    On Error GoTo fault
    Set httpObject = CreateObject("MSXML2.XMLHTTP")
    Dim JSON As Object

    IPADDRESS = Worksheets("API-Ref").Cells(2, 12)

    ' Emission-----
    httpObject.Open "GET", "" & IPADDRESS & "/mmsp/generalControl/setEmission/get", False
    httpObject.Send
    result = httpObject.ResponseText
    Set JSON = JsonConverter.ParseJson(result)
    EMISSION = JSON("data")
    If (EMISSION = "On") Then
        httpObject.Open "GET", "" & IPADDRESS & "/mmsp/generalControl/setEmission/set?Off", False
        httpObject.Send
    Else
        httpObject.Open "GET", "" & IPADDRESS & "/mmsp/generalControl/setEmission/set?On", False
        httpObject.Send
    End If

    Exit Sub
    'Fault????
fault:
    MsgBox ("No/Wrong Answer from PrismaPro! =>Error: " & ERROR)

End Sub
```

5. PV-Cloud



- **Folder:** „API“
Password necessary
- **Content:** *API Reference List*
MS-Excel-Sheets with VBA
cURL
API-Batch
LabView-Driver
Flowcharts, ...

Folder will be updated from time to time



5. PV-Cloud



Alle Dateien

Favoriten

Mit Dir geteilt

Von Dir geteilt

Geteilt über einen Link

Tags

QMS Software > API > +

1 Datei

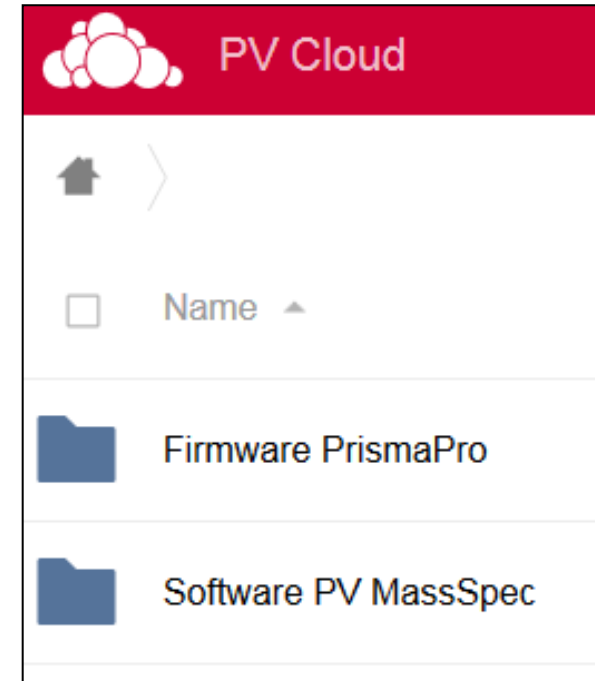
Herunterladen 1.6 MB Löschen

| | | | | | |
|---------------------------------------------------------|-------------------------------------------|------------------|-----|--------|------------------|
| <small>API-Folder >= FW1.9, Thomas B</small> | ReadMe_First.txt | Walther, Patrick | >>> | < 1 KB | vor 4 Monaten |
| | python-examples.zip | Walther, Patrick | >>> | 4 KB | vor einer Stunde |
| | PrismaPro_IO-Interface.pdf | Walther, Patrick | >>> | 1.4 MB | vor 5 Monaten |
| | PrismaPro_API.xlsm | Walther, Patrick | >>> | 2 MB | vor 4 Monaten |
| | matlab-examples.zip | Walther, Patrick | >>> | 475 KB | vor einer Stunde |
| | Changelog_PrismaPro_FW_1.9.0_API-User.pdf | Walther, Patrick | >>> | 820 KB | vor 4 Monaten |
| | API_Communication_OverView_2021.pdf | Walther, Patrick | >>> | 222 KB | vor 3 Monaten |
| | API Reference PrismaPro.pdf | Walther, Patrick | >>> | 4.4 MB | vor 4 Monaten |
| | API Quick Start Guide PrismaPro.pdf | Walther, Patrick | >>> | 1.6 MB | vor 2 Stunden |

5. PV-Cloud



- **Folder:** „PrismaPro“
PrismaPro User are invited
Password necessary
- **Content:** *Current Software PVMassSpec*
Current Firmware for PrismaPro




*Folder will be updated from time to time
and kept up to date*

6. Applications

- **MPP** PLC: SIEMENS
S7-300/400/1200/1500

PC: SIMATIC IPC127E/227E Nanobox PC
Windows 10

OPC-UA: Beckhoff, Rockwell Automation, Siemens
(any PLC/PC that can work as an „OPC-UA-Server“)
-  ■ **LabView-Driver:** Free of charge



7. Summary

- For this Communication a **PrismaPro** is required.
- For generell Application and Calibration use **PVMassSpec**
- For a higher-level Communication (e.g. LabView, PC, ...) use additional the **MMSP-API**

For own API programming with C#, VBA, C#, Python, GraphQL,... LabView

Without own API programming use our Application **MPP**





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