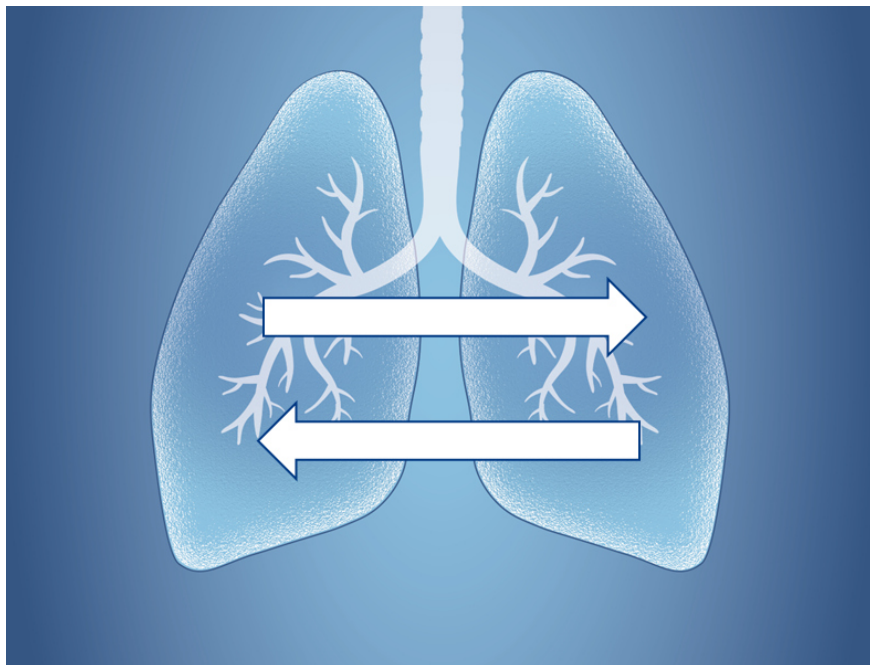




SPIROWARE - HIS

Interface



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The instrument should be operated and serviced only by trained professionals.

SPIROWARE® is a registered trademark of ECO MEDICS.
The instrument is marketed by the label ECO MEDICS.

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Note: This manual is valid for SPIROWARE® 3.3.0 or higher.

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"Investigational Device" / "Instrument de recherche"

Table of Contents

1.	Introduction	4
2.	HIS Request	4
2.1.	Configuration of TCP/IP Channel.....	5
2.2.	Format of HIS Request	5
3.	HIS Response	5
3.1.	Format of HIS Response.....	6
4.	Test Results	6
4.1.	Configuration of Export Directory.....	7
4.2.	Format of XML Test Results.....	7
4.2.1.	<i>Example of N2-MBW Results.....</i>	<i>8</i>
4.2.2.	<i>Example of N2-MBW Results.....</i>	<i>9</i>
4.2.3.	<i>Example of FeNO Single Breath Test Results.....</i>	<i>9</i>
4.2.4.	<i>Example of FeNO Multiple Breath Test Results.....</i>	<i>10</i>
4.2.5.	<i>Example of Nasal NO Test Results.....</i>	<i>11</i>
4.2.6.	<i>Example of NO Offline Test Results</i>	<i>11</i>
4.3.	Format of PDF Test Results.....	12
4.3.1.	<i>Example of PDF Test Results.....</i>	<i>12</i>

1. Introduction

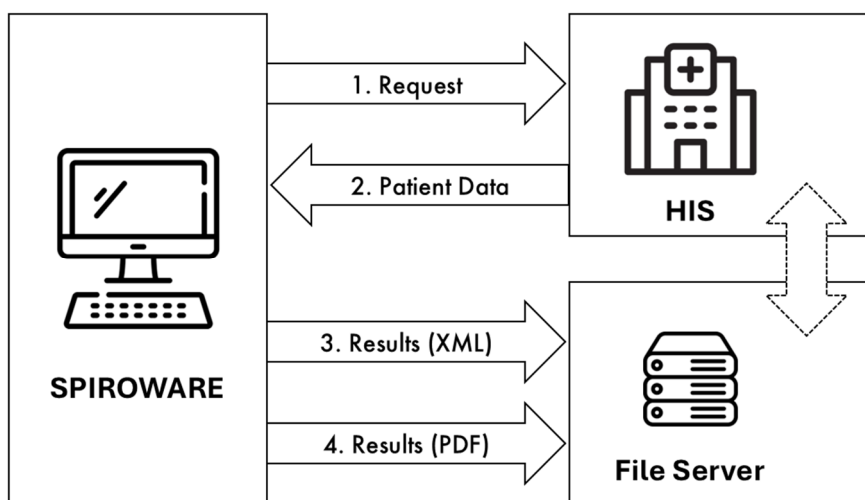
The HIS-Interface option of SPIROWARE® software allows the exchange of information between SPIROWARE® and the hospital information system (HIS).

The exchange of patient demographics is based on the bi-directional exchange of XML files over a TCP/IP channel. The test results are exported to a defined directory at the end of a test session. data exchanged includes patient demographics and test results at the end of a test session.

When a new patient is created, the patient ID is entered into SPIROWARE® software. SPIROWARE® will send a request with this patient ID to the HIS.

HIS will look up the patient demographics and return the information back to SPIROWARE®. This information is used to fill out all patient information fields in the local SPIROWARE® database.

After completion of the test, SPIROWARE® automatically exports the results as XML file in a defined directory on a central server or local directory. In addition, a PDF report will automatically be generated and exported in the same directory. HIS can access the XML and PDF files from the defined directory and import the data.



2. HIS Request

When testing a patient for the first time, the patient must be created in the SPIROWARE® software. From the main patient list window, click on the 'Register New Patient' button. Here, the HIS patient ID can be entered to import the patient data from the HIS by clicking on the 'Import from HIS' button.

2.1. Configuration of TCP/IP Channel

The TCP/IP channel can be configured in SPIROWARE® software under 'Administration' → 'System Settings' → 'Sensor'. Select HIS Connection and enter the IP address and TCP port.

2.2. Format of HIS Request

SPIROWARE generates an XML file with the following format:

```
<HisRequest>
  <Patient ID="1234" />
</HisRequest>
```

The patient ID, e.g. "1234", results from the manual entry.

3. HIS Response

SPIROWARE® expects a response in form of an XML file over the same TCP/IP channel. The XML file should include the following information:

- Patient ID
- Visit ID*
- Order Number*
- Patient Last Name
- Patient First Name
- Gender
- Date of Birth
- Attending Doctor
- Referring Doctor

* The unique patient ID can have several visits and every visit can be linked to an order.

The visit ID, order number, attending doctor and referring doctor are optional and can be returned with the test results. The information on the attending and referring doctor can include names or numbers.

3.1. Format of HIS Response

SPIROWARE accepts an XML file with the following format:

```
<HisResponse>
  <Patient>
    <ID>1234</ID>
    <FirstName>Hans</FirstName>
    <LastName>Muster</LastName>
    <Gender>Male</Gender>
    <DateOfBirth>1990-01-01</DateOfBirth>
    <VisitID>636631944715603488</VisitID>
    <OrderNumber>131720640715603488</OrderNumber>
    <AttendingDoctor>Dr Smith</AttendingDoctor>
    <ReferringDoctor>Dr Miller</ReferringDoctor>
  </Patient>
</HisResponse>
```

The patient ID, first and last name, gender and data of birth are mandatory information. The visit ID, order number, attending and referring doctors are optional information.

4. Test Results

Each time a new test is started for a patient, the operator has the choice of importing additional data from HIS by clicking the button 'Get data from HIS' or entering additional data manually. The additional data includes the visit ID, order number, attending doctor and referring doctor. This data will be exported together with the results at the end of the test.

Please enter and confirm the HIS data:

If the patient has a HIS-ID assigned, get the actual HIS data for the test by clicking the button 'Get data from HIS'.

If the patient has no HIS-ID or HIS is currently not available, please enter the HIS data for the test manually.

HIS Patient ID:

Patient:

Visit ID:

Order Number:

Attending Doctor:

Referring Doctor:

Once the test has been concluded, the main results are summarized in an XML file and exported to a defined directory. A PDF report will automatically be exported to the same directory.

HIS can import the XML file from the defined directory.

Note: The test must be concluded. If the test is saved as a draft, the results will not be exported.

4.1. Configuration of Export Directory

The export directory can be defined in SPIROWARE® software under 'Administration' → 'System Settings' → 'Sensor'. Click on the "... " button and select an existing directory or create a new directory. The export directory can be a local file path or on a central server.

☒ HIS Connection

IP Address

TCP Port

Export directory

4.2. Format of XML Test Results

The XML file includes the following information:

- Patient ID
- Visit ID
- Order Number
- Patient Last Name

- Patient First Name
- Gender
- Date of Birth
- Attending Doctor
- Referring Doctor
- Datetime Stamp of Examination
- Measured Values
- Filename of the PDF Document

The exact format and content of the XML file depends on the test type as each tests reports different values. Examples of the most common test types are provided below.

The file name includes the patient ID, test date and time and ends with 'HIS.xml':

<patient ID>_<yyyymmdd>-<hhmmss>_HIS.xml

Example: MUSHAN01012009_20250116-092637_HIS.xml

4.2.1. Example of N2-MBW Results

```
<HisRequest>
  <Patient>
    <ID />
    <FirstName>Hans</FirstName>
    <LastName>Muster</LastName>
    <Gender>Male</Gender>
    <DateOfBirth>1990-01-01T00:00:00</DateOfBirth>
    <HeightCentimeters>183</HeightCentimeters>
    <WeightKilograms>85</WeightKilograms>
    <AsthmaStatus>No</AsthmaStatus>
    <Ethnicity>Caucasian</Ethnicity>
    <SmokerStatus>No</SmokerStatus>
  <Tests>
    <Test>
      <VisitID />
      <OrderNumber />
      <AttendingDoctor />
      <ReferringDoctor />
      <TestDatetime>2020-09-16T08:24:46</TestDatetime>
      <TestType>N2MultiBreathWashoutTest</TestType>
      <Result>
        <FRC>4.84541332152876</FRC>
        <LCI25>7.0999260920605023</LCI25>
        <LCI5>5.3444960622742368</LCI5>
        <ScondVT>0.027724934464115475</ScondVT>
        <SacinVT>0.057717188138101255</SacinVT>
        <PacinVT>0.041199995281297343</PacinVT>
        <M1divM0>1.662279083024464</M1divM0>
        <M2divM0>5.3573586368403916</M2divM0>
        <N2CetNormTO6>3.5513908711023228</N2CetNormTO6>
        <VdCO2>19.787452788957566</VdCO2>
        <WashoutTime>195.24</WashoutTime>
      </Result>
      <ReportFilename>MUSHAN01012009_20200916-082446-
        N2MultiBreathWashoutTest.pdf</ReportFilename>
    </Test>
  </Tests>
</HisRequest>
```



```

    </Test>
  </Tests>
</Patient>
</HisRequest>

```

4.2.2. Example of N2-MBW Results

```

<HisRequest>
  <Patient>
    <ID />
    <FirstName>Hans</FirstName>
    <LastName>Muster</LastName>
    <Gender>Male</Gender>
    <DateOfBirth>1990-01-01T00:00:00</DateOfBirth>
    <HeightCentimeters>183</HeightCentimeters>
    <WeightKilograms>85</WeightKilograms>
    <AsthmaStatus>No</AsthmaStatus>
    <Ethnicity>Caucasian</Ethnicity>
    <SmokerStatus>No</SmokerStatus>
    <Tests>
      <Test>
        <VisitID />
        <OrderNumber />
        <AttendingDoctor />
        <ReferringDoctor />
        <TestDatetime>2020-09-22T08:25:11</TestDatetime>
        <TestType>N2SingleBreathWashoutTest</TestType>
        <Result>
          <SIII>0.19383609466406665</SIII>
          <SIIIVC>1.1351800524912967</SIIIVC>
          <VC>5.91904248046875</VC>
          <CV>0.988547542437515</CV>
        </Result>
        <ReportFilename>MUSHAN01012009_20200922-082511-
          N2SingleBreathWashoutTest.pdf</ReportFilename>
      </Test>
    </Tests>
  </Patient>
</HisRequest>

```

4.2.3. Example of FeNO Single Breath Test Results

```

<HisRequest>
  <Patient>
    <ID />
    <FirstName>Hans</FirstName>
    <LastName>Muster</LastName>
    <Gender>Male</Gender>
    <DateOfBirth>1990-01-01T00:00:00</DateOfBirth>
    <HeightCentimeters>183</HeightCentimeters>
    <WeightKilograms>85</WeightKilograms>
    <AsthmaStatus>No</AsthmaStatus>
    <Ethnicity>Caucasian</Ethnicity>
    <SmokerStatus>No</SmokerStatus>

```

```

<Tests>
  <Test>
    <VisitID />
    <OrderNumber />
    <AttendingDoctor />
    <ReferringDoctor />
    <TestDatetime>2012-05-14T09:25:53</TestDatetime>
    <TestType>SingleBreathTest</TestType>
    <Result>
      <OverallFeNO>24.197359085083008</OverallFeNO>
      <OverallFeNOVariancePer-cents> 5.5254529048700309</Over-
        allFeNOVariancePercents>
    </Result>
    <ReportFilename>MUSHAN01012009_20120514-092553-
      SingleBreathTest.pdf</ReportFilename>
  </Test>
</Tests>
</Patient>
</HisRequest>

```

4.2.4. Example of FeNO Multiple Breath Test Results

```

<HisRequest>
  <Patient>
    <ID />
    <FirstName>Hans</FirstName>
    <LastName>Muster</LastName>
    <Gender>Male</Gender>
    <DateOfBirth>1990-01-01T00:00:00</DateOfBirth>
    <HeightCentimeters>183</HeightCentimeters>
    <WeightKilograms>85</WeightKilograms>
    <AsthmaStatus>No</AsthmaStatus>
    <Ethnicity>Caucasian</Ethnicity>
    <SmokerStatus>No</SmokerStatus>
  <Tests>
    <Test>
      <VisitID />
      <OrderNumber />
      <AttendingDoctor />
      <ReferringDoctor />
      <TestDatetime>2009-07-01T13:32:22</TestDatetime>
      <TestType>MultiBreathTest</TestType>
      <Result>
        <FeNOMean>4.919532299041748</FeNOMean>
        <FeNOVariation>23.655869964125934</FeNOVariation>
      </Result>
      <ReportFilename>MUSHAN01012009_20090701-133222-
        MultiBreathTest.pdf</ReportFilename>
    </Test>
  </Tests>
</Patient>
</HisRequest>

```

4.2.5. Example of Nasal NO Test Results

```

<HisRequest>
  <Patient>
    <ID />
    <FirstName>Hans</FirstName>
    <LastName>Muster</LastName>
    <Gender>Male</Gender>
    <DateOfBirth>1990-01-01T00:00:00</DateOfBirth>
    <HeightCentimeters>183</HeightCentimeters>
    <WeightKilograms>85</WeightKilograms>
    <AsthmaStatus>No</AsthmaStatus>
    <Ethnicity>Caucasian</Ethnicity>
    <SmokerStatus>No</SmokerStatus>
    <Tests>
      <Test>
        <VisitID />
        <OrderNumber />
        <AttendingDoctor />
        <ReferringDoctor />
        <TestDatetime>2009-08-24T09:09:51</TestDatetime>
        <TestType>NoNasalTest</TestType>
        <Result>
          <OverallFeNO>770.25323486328125</OverallFeNO>
        </Result>
        <ReportFilename>MUSHAN01012009_20090824-090951-
          NoNasalTest.pdf</ReportFilename>
      </Test>
    </Tests>
  </Patient>
</HisRequest>

```

4.2.6. Example of NO Offline Test Results

```

<HisRequest>
  <Patient>
    <ID />
    <FirstName>Hans</FirstName>
    <LastName>Muster</LastName>
    <Gender>Male</Gender>
    <DateOfBirth>1990-01-01T00:00:00</DateOfBirth>
    <HeightCentimeters>183</HeightCentimeters>
    <WeightKilograms>85</WeightKilograms>
    <AsthmaStatus>No</AsthmaStatus>
    <Ethnicity>Caucasian</Ethnicity>
    <SmokerStatus>No</SmokerStatus>
    <Tests>
      <Test>
        <VisitID />
        <OrderNumber />
        <AttendingDoctor />
        <ReferringDoctor />
        <TestDatetime>2009-10-01T13:36:29</TestDatetime>
        <TestType>NoOfflineTest</TestType>
        <Result>
          <FeNOMean>16.147178649902344</FeNOMean>
        </Result>
      </Test>
    </Tests>
  </Patient>
</HisRequest>

```

```

    <FeNOMin>14.721902847290041</FeNOMin>
    <FeNOMax>17.25</FeNOMax>
    <FeNOVariation>14.655635667883832 </FeNOVariation>
    <PlateauDurationSeconds>10</PlateauDurationSeconds>
  </Result>
  <ReportFilename>MUSHAN01012009_20091001-133629-
  NoOfflineTest.pdf</ReportFilename>
</Test>
</Tests>
</Patient>
</HisRequest>

```

4.3. Format of PDF Test Results

In addition to the XML file, a PDF file will automatically be generated and stored in the defined export directory.

The file name includes the patient ID, test date and time and the test type:

<Patient ID>_<yyyymmdd>-<hhmmss>-<test type>.pdf

Example: MUSHAN01012009_20250117-100840-SingleBreathTest.pdf

The format of the PDF test results file depends on the test type and the selected report template. For each test type, a preferred test template can be selected as default under 'Administration' → 'Report Templates'.

4.3.1. Example of PDF Test Results

As example, a PDF report of a FeNO single breath test is shown below.

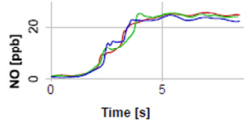
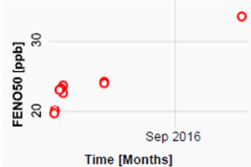
FeNO
 Fractional Exhaled Nitric Oxide
Single Breath


 ECO MEDICS AG

Patient

Name:	Muster Hans	SPIROWARE Version:	3.3.2
ID:	MUSHAN01012009	Responsible:	
Date of Birth:	01.10.1980	Test Date:	14.05.2012
Age:	33.4	Cal. Status Flow:	OK
Height:	[cm] 183.0	Cal. Status NO:	Expired
Weight:	[kg] 83.0		
Gender:	Male		
BMI:	24.8		

Notes:

FeNO – Single Breath Test

Trial #	Predicted	Results	Interpretation	max. dev. %	1	2	3	
FeNO	[ppb]	5-20	24.20	Elevated	6	24.74	24.47	23.38
V'NO	[nl/min]		73.54			74.73	75.88	70.02
FINO	[ppb]		—			0.71	0.94	0.72
exp. Flow	[ml/s]		—			50.34	51.67	49.93

Test Information

ATS/ERS compliant: yes
 Report generated: 07.01.2025
 Warnings: No quality warnings
 Comments:

Signature: _____

Note:

Report templates can be customized. For more information, please see the Report Template Manual available on the ECO MEDICS CustomerNet.