IPETRONIK

IPEMOTION
Software

IPEmotion_PlugIn_SERIAL_V01_01_00

7. Dezember 2017

Table of Contents

1 Important and general information

1.1 Important information

Please follow these instructions before and during the use and application on any IPETRONIK product!

1.1.1 Safety and Warning instructions

Please follow the instructions **and** information as contained in the user manual!

1. The user can **influence an electronic system by applying the IPETRONIK product**. This might cause risk of personal injury or property damages.
2. The **use and application of the IPETRONIK product is permitted only to qualified professional staff**, as well as, only in appropriate manner and in the designated use.
3. **Before using an IPETRONIK measurement system** in the vehicle it **has to be verified** that **no function of the vehicle, which is relevant for secure operation, might be influenced**:
   - by the installation of the IPETRONIK measurement system in the vehicle,
   - by an potential malfunction of the IPETRONIK system during the test drive.

   In order to avoid possible danger or personal injury and property damages, appropriate actions are to be taken; such actions have to bring the entire system into a secured condition (e.g. by using a system for emergency stop, an emergency operation, monitoring of critical values).

   Please check the following points to avoid errors:

   - Adaption of sensors to components of the electrical system / electronics, brake system, engine and transmission control, chassis, body.
   - Tap of one or several bus systems (CAN, LIN, ETHERNET) including the required electrical connection(s) for data acquisition.
   - Communication with the vehicle's control units (ECUs), especially with such of the brake system and/or of the engine and transmission control (power train control system).
   - Installation of components for remote data transmission (mobiles, GSM/GPRS modems, WiFi and Bluetooth components).

The products can be operated in extended temperature ranges greater $70\,^{\circ}\mathrm{C}$ and therefore the operator has to take safety measures to avoid any skin burnings on hot surfaces while touching the products.

4. **Before** directly or indirectly using **the data acquired by an IPETRONIK measurement system to calibrate control units, please review the data regarding to plausibility**.
5. With regard to the application of IPETRONIK products in vehicles during use on public roads the manufacturer and/or registered user of the vehicle **has to ensure that all changes/modifications have no influence concerning the license of the vehicle or its license of operation.**
6. **User does agree to the instructions and regulations as mentioned above.** In case the user does not agree with the instructions and regulations as mentioned above, he has to notify this expressly and immediately in writing to IPETRONIK before confirming the sales contract.

1.2 Terms and conditions

See IPETRONIK website for details: https://www.ipetronik.com/

1.2.1 Legend of used icons

	***Tip***	*This icon indicates a useful tip that facilitates the application of the software.*
	***Information***	*This icon indicates additional information for a better understanding.*
	***Attention!***	*This icon indicates important information to avoid potential error messages.*

1.2.2 Support

Headquarter:

IPETRONIK GmbH & Co. KG
Im Rollfeld 28
76532 Baden-Baden, Germany
Phone +49 7221 9922 0
Fax +49 7221 9922 100
info@ipetronik.com
www.ipetronik.com
Limited commercial partnership with its head office in Baden-Baden, registry court HRA No. 201313
IPETRONIK Verwaltungs-GmbH Baden-Baden is an individually liable society, registry court Mannheim HRB No. 202089
CEOs: A. Wocke, C. Buchholz

Technical support and product information
www.ipetronik.com e-mail: support@ipetronik.com

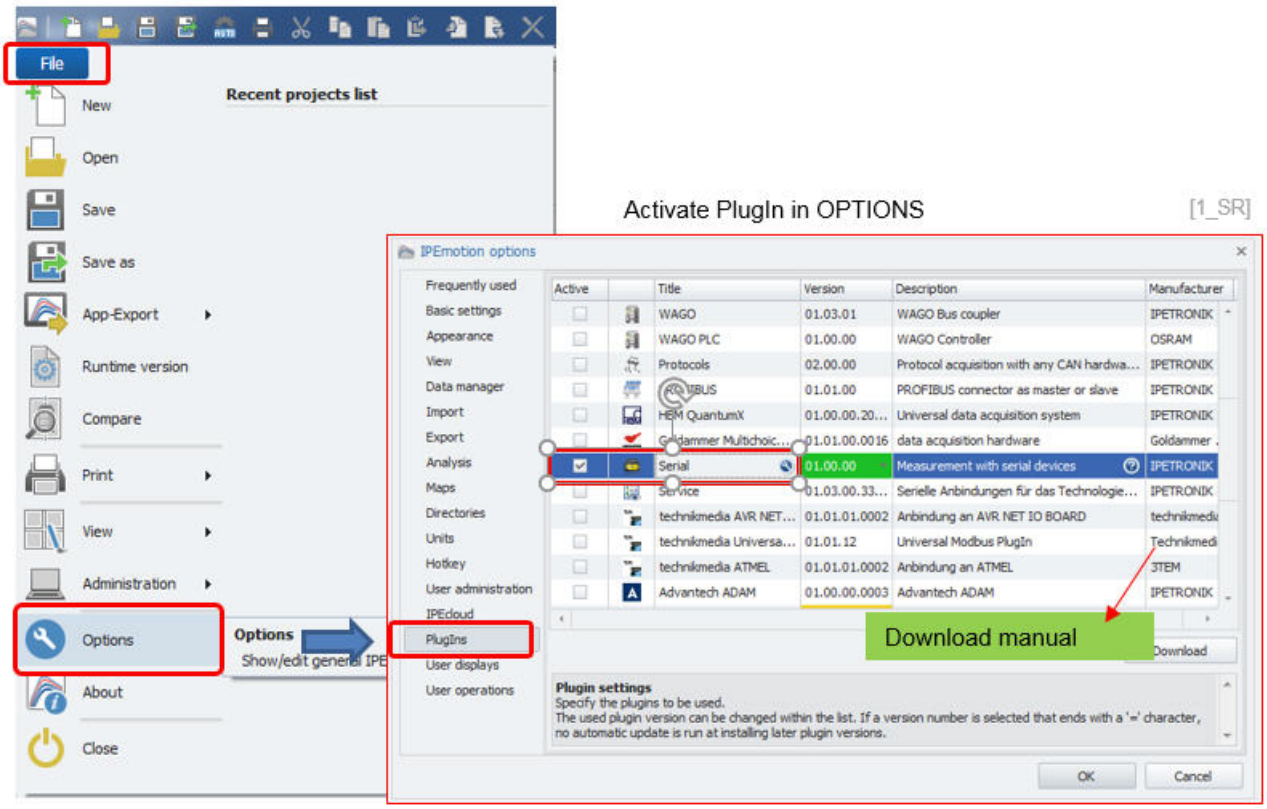
2 PlugIn overview

2.1 PlugIn description

The Serial PlugIn is providing a general interface to many serial devices. The hardware specific serial communication functions are integrated to the PlugIn via a serial extension dll. The benefit for the user is that the overall overhead of the PlugIn development is not required. Only the extension .dll is needed to establish a communication to your hardware.

2.2 PlugIn Installation

In order to use the PlugIn together with IPEmotion you need to install it. The PlugIn is available for download from the IPETRONIK website: https://www.ipetronik.com/ When you have installed the PlugIn, you need to launch the IPEmotion software. Then you need to access the application menu and open the OPTIONS. In the OPTIONS you can activate the PlugIn as indicated below.



2.3 Content of the download package

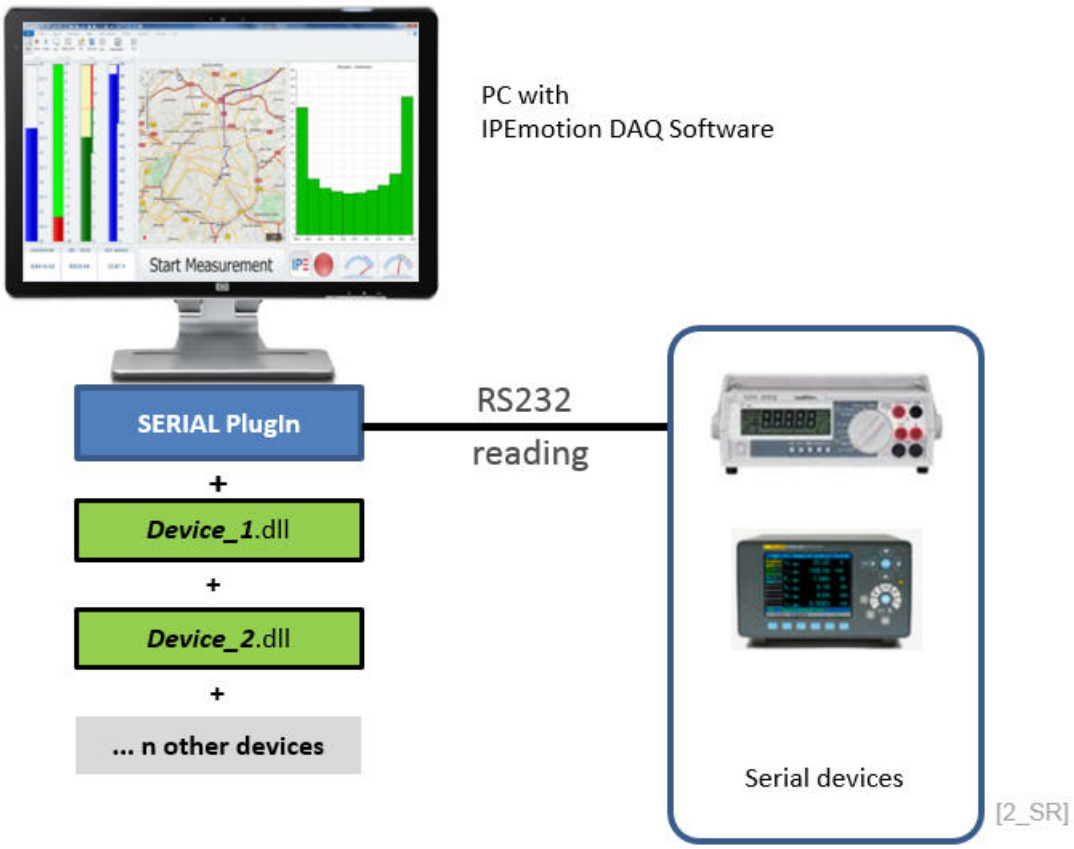
Downloading the Serial PlugIn from the IPETRONIK website you will receive the following documents:

- Setup for the Serial PlugIn
- Extension DLL for serial devices Metrix MX556 and source code
- Template for the Visual Studio extension DLL development
- IPEmotion reference project (.iwf) for Fluke Norma 3000 Power Analyzer

3 PlugIn configuration

3.1 Functional architecture

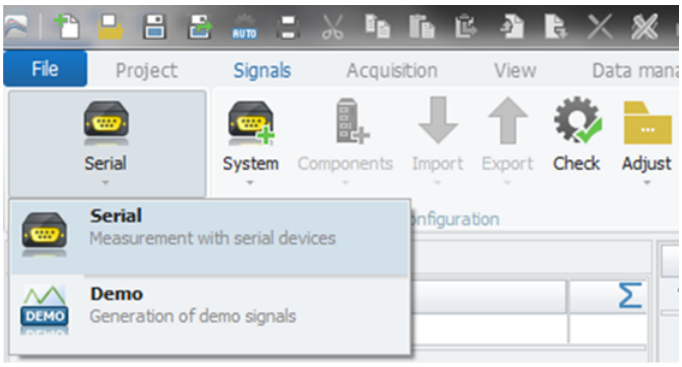
The communication of the serial devices is handled through a device-specific .DLL. This .DLL is handling the communication between the PlugIn / IPEmotion and the serial device.



⚠ ***Attention!*** *Without this device .DLL it is not possible to read data from the serial device.*

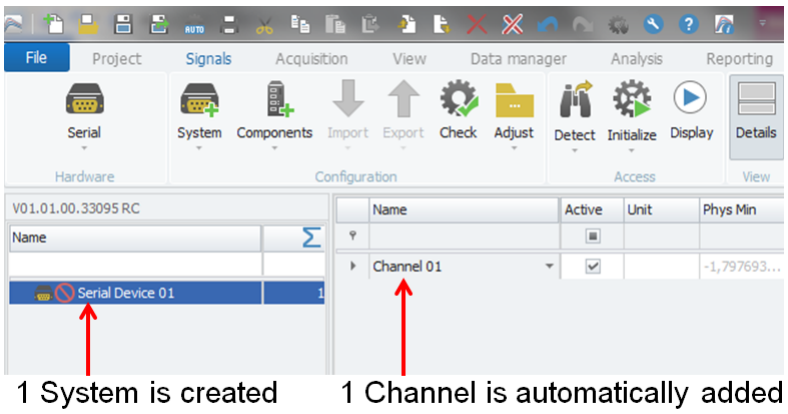
3.1.1 Create interface system

The Serial PlugIn supports data communication to serial devices. In the first step a SERIAL system is created.



[2]

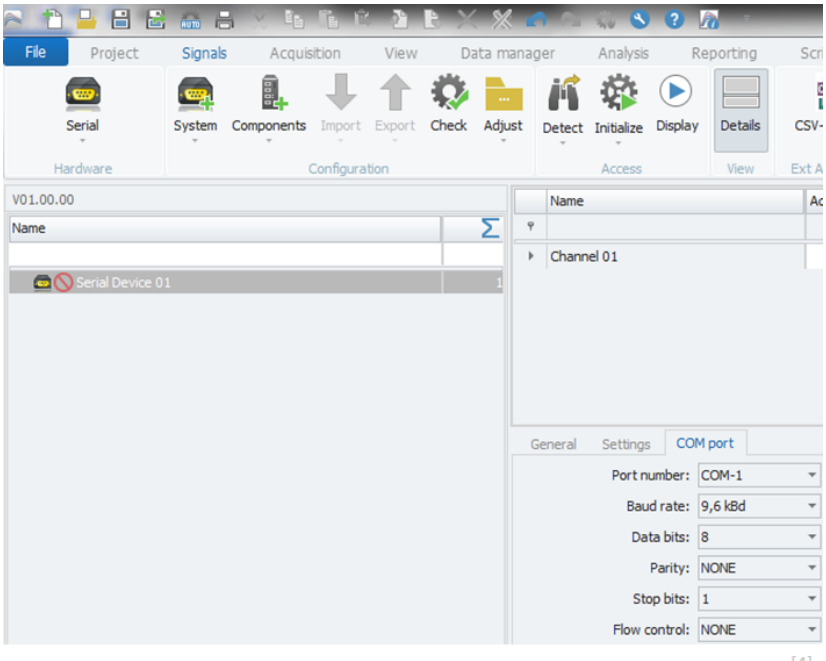
The system with one data channel is automatically created.



[3]

3.1.2 Configuring COM Port interface parameters

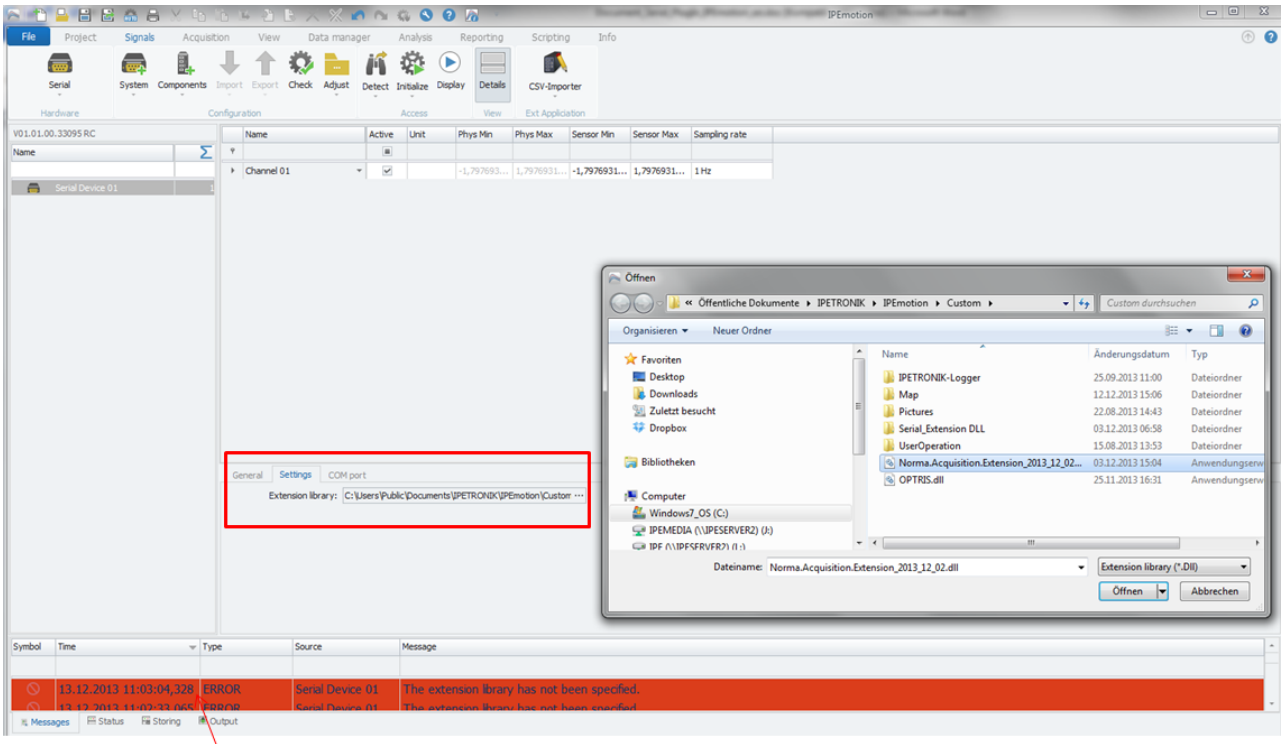
After the Serial system is created, the serial communication parameters are configured in the “COM port” tab sheet. The communication settings are taken from the manual of the serial device. The COM port number of the serial interface used by the PC can be found in the “device manager” or under “devices and printers”.



[4]

3.1.3 Link your device DLL to the Serial System

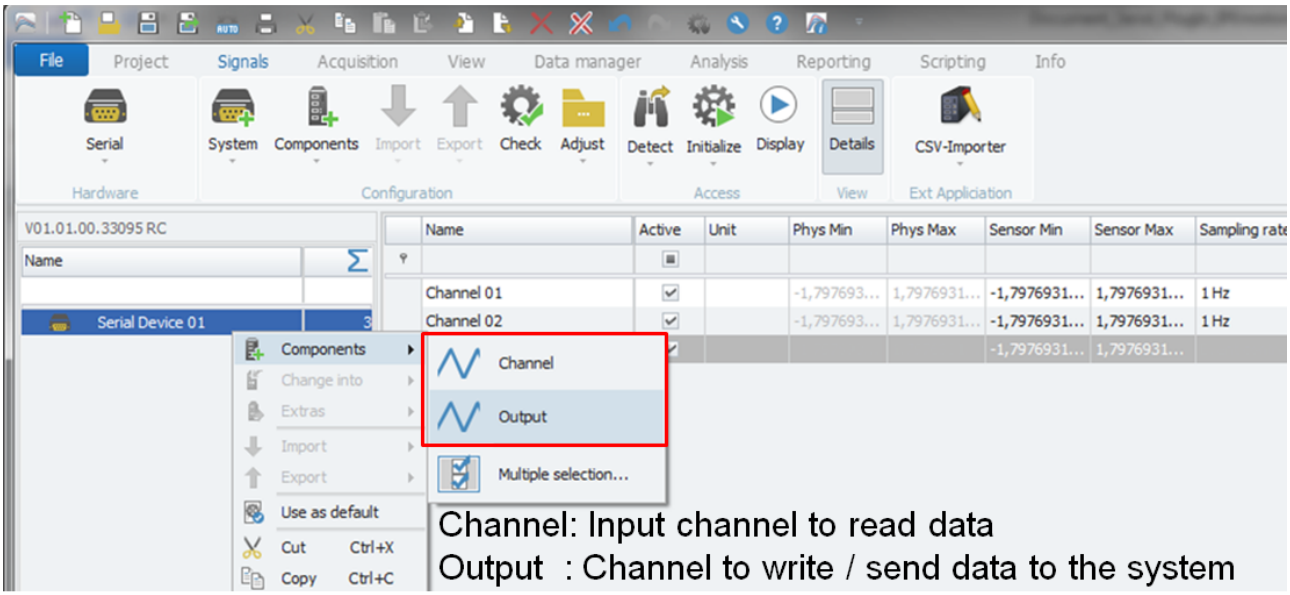
Apart from defining your serial interface parameters you need to link the DLL of your device to the Serial system. In the tab sheet Settings you can open the file search dialog and link your DLL to the Serial System.



[5]

3.2 Creating input and output channels

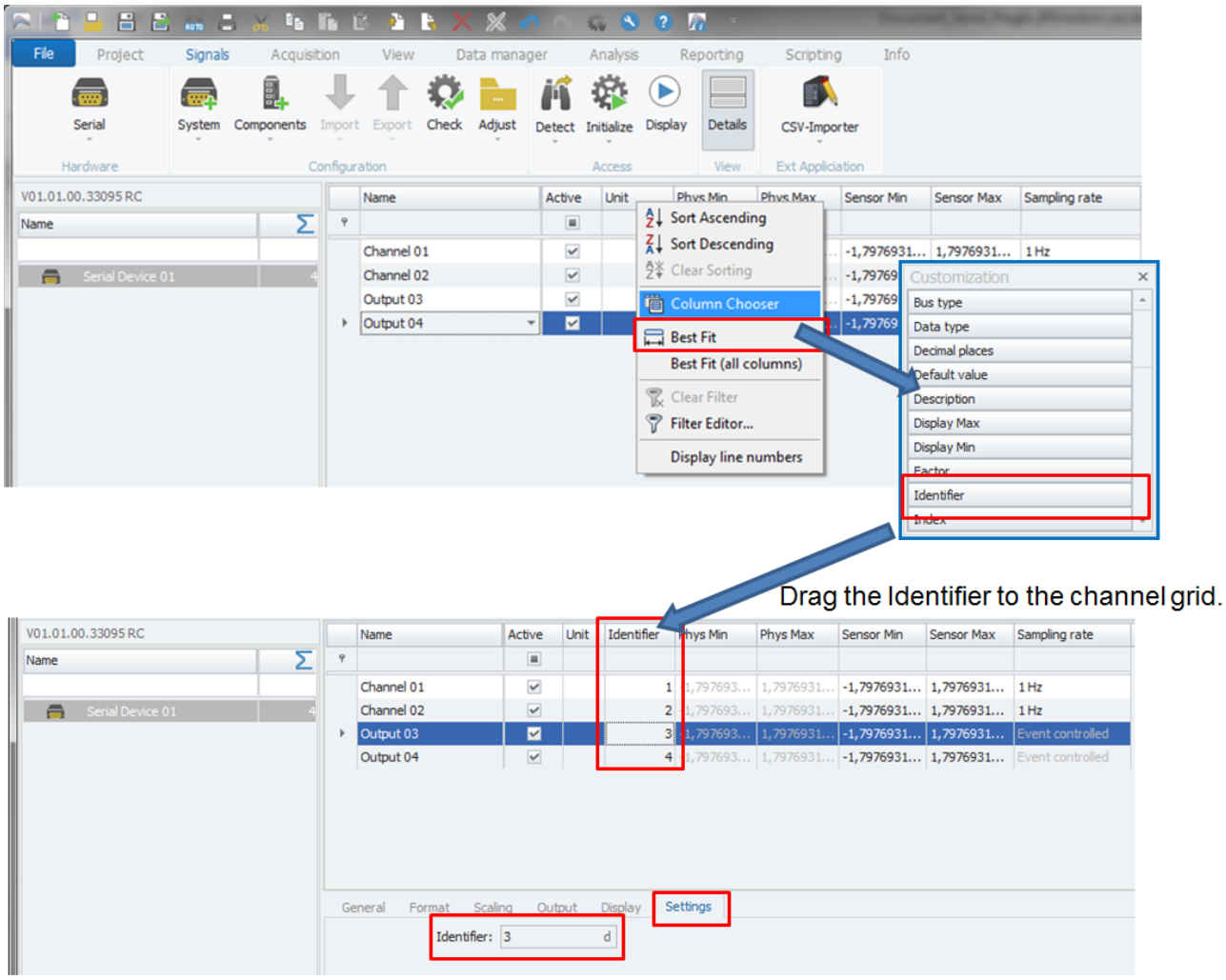
In order to read the data from the device you need to define your measurement channels. The PlugIn supports also output channels to write data to the Serial device.



[6]

3.2.1 Define channel names and the related Identifier number

After creating your measurement channels you need to specify the channel names and the Identifier numbers. The easiest way to see all the Identifier numbers is to open the column chooser and link the Identifier column to you channel grid.



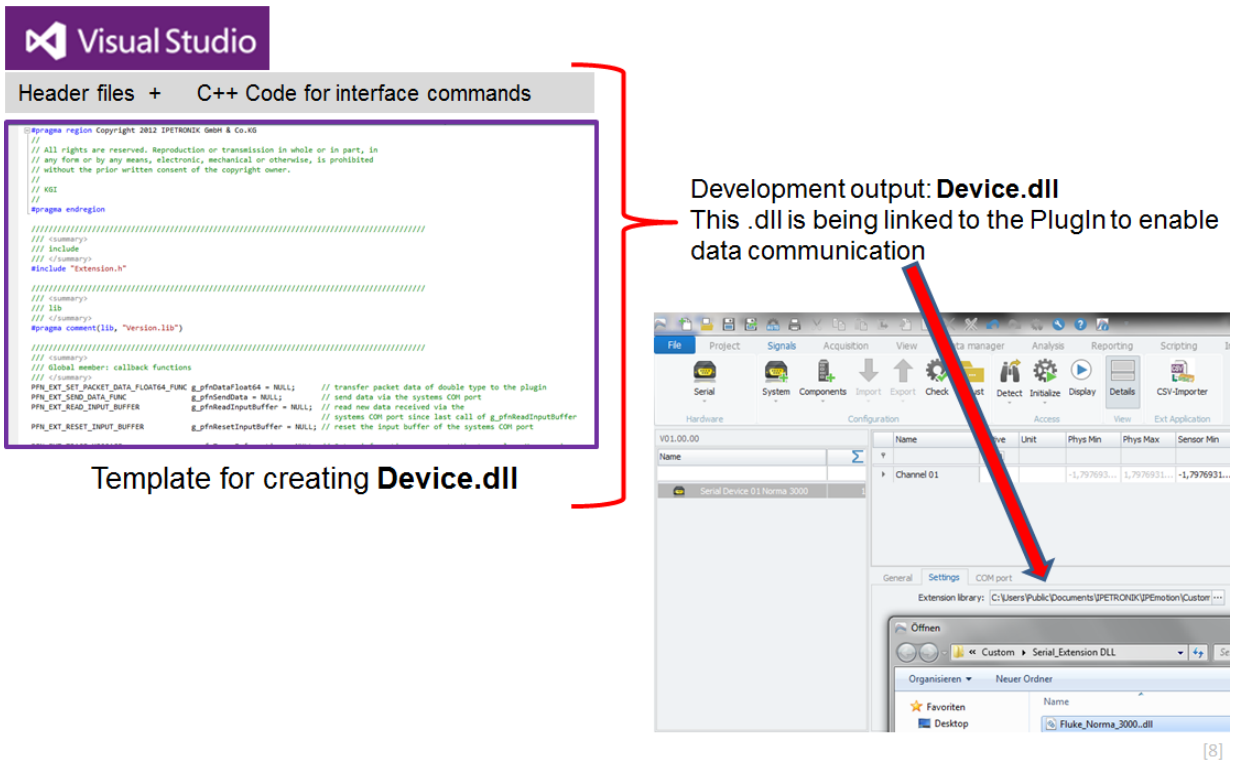
[7]

The Identify Number is also indicated on channel level in the tab sheet Settings. The measurement channel name, identifier number and the device DLL are interrelated.
In the device specific DLL the programmer defines on which Identifier number **(“PacketIdentifier”)** which measurement value is displayed in IPEmotion.

4 Develop your own device DLL

4.1 Visual Studio Development template

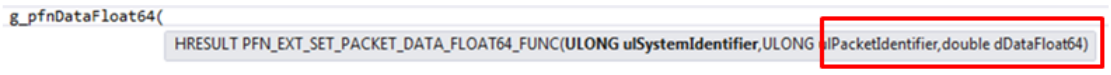
In order to develop this device-specific DLL, a visual studio development template is provided by IPETRONIK. In this template, the programming for the interface commands is integrated so that the DLL is working together with the PlugIn. Help information for the interface programming is directly included in the visual studio template file.



[8]

When programming the extension DLL, it is important that every value which should be available for data transfer to IPEmotion has its **unique identifier number ("PacketIdentifier").** This identifier number is specifying which value of the serial device will be shown on this channel in IPEmotion.

The following screenshot shows a section from the C++ programming where the "PacketIdentifier" is highlighted.



[9]

The identifier is the key to specify which value of the serial device is displayed on which channel in IPEmotion. When channels are created, they must include information about the Identifier number in the tab sheet settings. The DLL developer should create a list which is relating identifier numbers to the transmitted values. See for example chapter 4.2 for the Norma 3000 power analyzer.

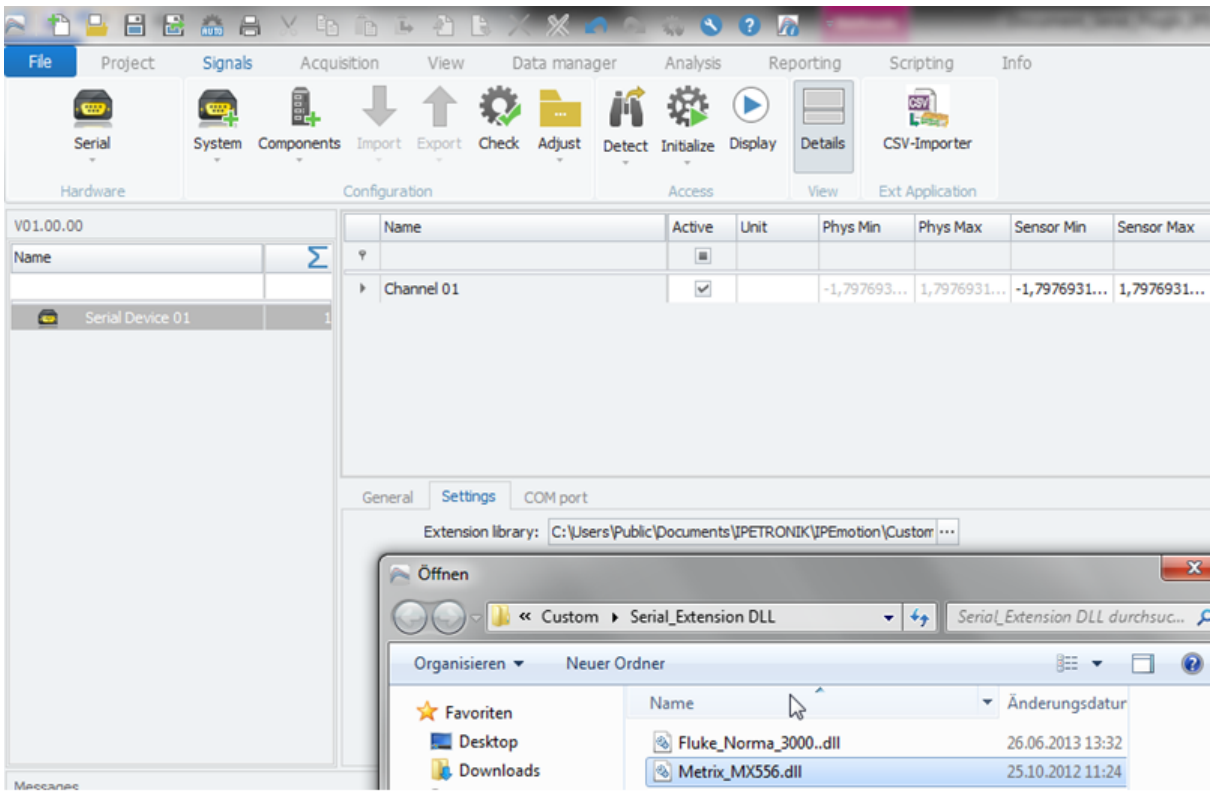
Information *IPETRONIK provides support for the DLL development. Furthermore, IPETRONIK develops the DLL for you on request.*

5 Examples for device-specific interface DLL

5.1 Metrix MX556 Multimeter

For the Metrix MX556 device, an acquisition DLL was developed. In order to read data from this device into IPEmotion, the device-specific DLL needs to be linked to the PlugIn.

Select ***Serial Device 01*** and select Metrix_MX556.dll in the ***Settings*** Tab sheet.



[10]

The user can store the DLL in any directory. The PlugIn is searching the default directory on WIN 7 OS: C:\Users\Public\Documents\IPETRONIK\IPEmotion\Custom\

To start the data transfer from the METRIX device, the device button <RS232>must be pressed after start in order to activate serial communication of the device.

To get live data in IPEmotion, the data display needs to be activated.

5.1.1 Channel identifier list for Metrix MX556

The reading in IPEmotion is the value you can see on the digital display of the instrument. The measurement unit defined on the device side A, V, Ohm etc. . . needs to be manually defined also in IPEmotion. The measurement unit cannot be automatically transferred of the serial interface.

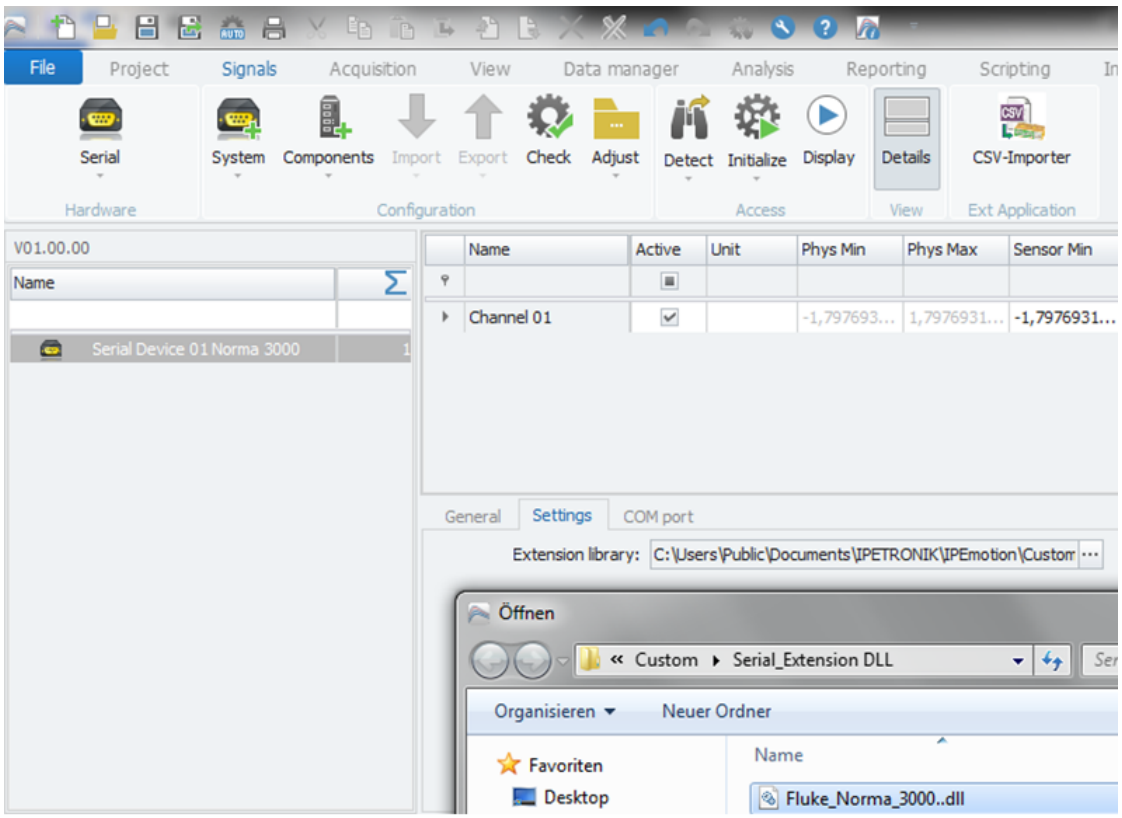
Identifier Number	Function for Metrix MX556 Multimeter
1	Display channel of the device

5.2 Fluke Norma 3000 Power Analyzer

For the Fluke Norma 3000 device, an acquisition DLL was developed. In order to read data from this device into IPEmotion, the device-specific DLL needs to be included in the PlugIn.

Select ***Serial Device 01*** and select and link the Fluke_Norma_3000.DLL in the ***Settings*** Tab sheet.

The user can store the DLL in any directory. On WIN 7 OS, the PlugIn is searching the default directory for the DLL: C:\Users\Public\Documents\IPETRONIK\IPEmotion\Custom\

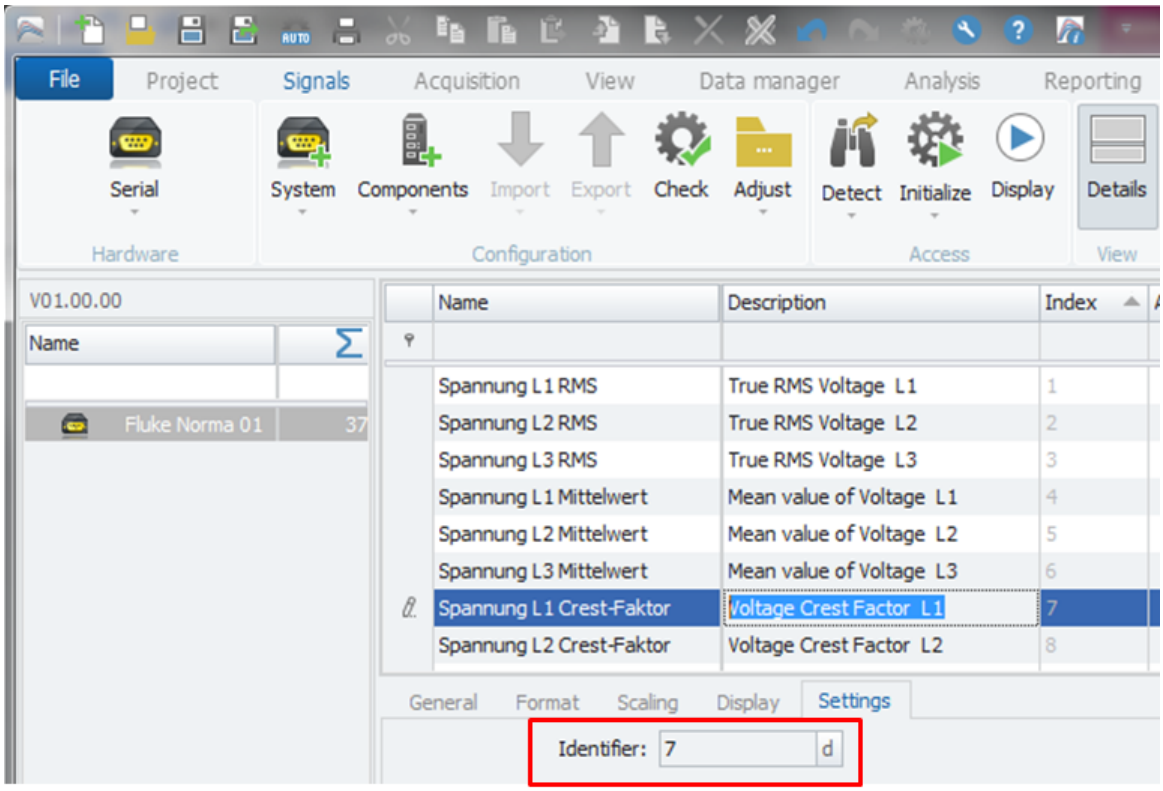


[11]

This DLL is supporting 37 different functions which are listed below. If more functions are required, the DLL needs to be updated. Each function has a unique identifier.

Tip

To read the "Voltage Crest Factor L1", a channel needs to be created with identifier "7".



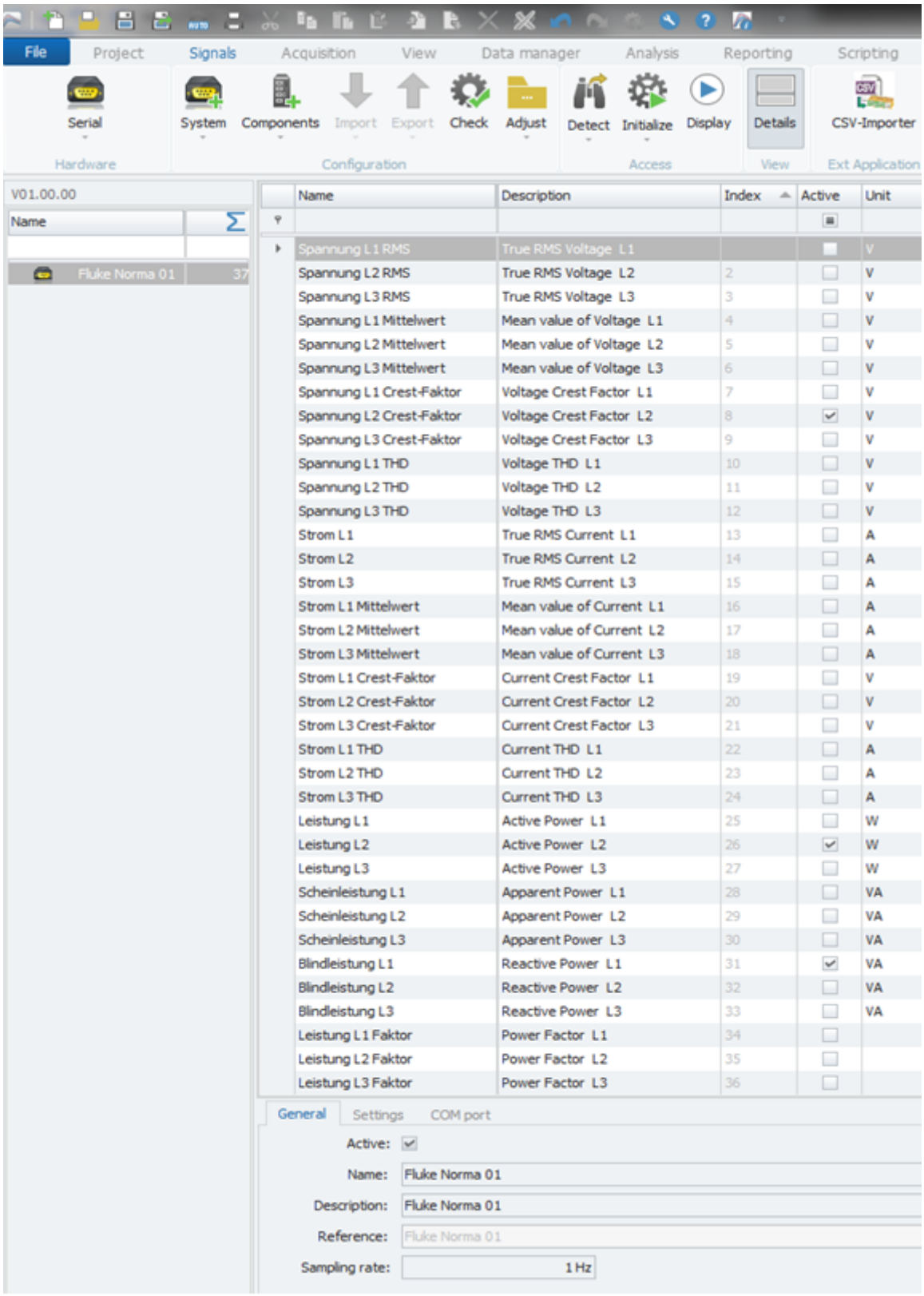
[12]

5.2.1 Channel identifier list for Fluke Norma 3000

Identifier Number	Function for Fluke Norma 3000 Power Analyzer
1	True RMS Voltage L1
2	True RMS Voltage L2
3	True RMS Voltage L3
4	Mean value of Voltage L1
5	Mean value of Voltage L2
6	Mean value of Voltage L3
7	Voltage Crest Factor L1
8	Voltage Crest Factor L2
9	Voltage Crest Factor L3
10	Voltage THD L1
11	Voltage THD L2
12	Voltage THD L3
13	True RMS Current L1
14	True RMS Current L2
15	True RMS Current L3
16	Mean value of Current L1
17	Mean value of Current L2
18	Mean value of Current L3
19	Current Crest Factor L1
20	Current Crest Factor L2
21	Current Crest Factor L3
22	Current THD L1
23	Current THD L2
24	Current THD L3
25	Active Power L1
26	Active Power L2
27	Active Power L3
28	Apparent Power L1
29	Apparent Power L2
30	Apparent Power L3
31	Reactive Power L1
32	Reactive Power L2
33	Reactive Power L3
34	Power Factor L1
35	Power Factor L2
36	Power Factor L3
37	SYNC frequency

5.2.2 Reference configuration for Norma 3000

The following screenshot is taken from a reference project where 37 channels were created to display data from each function.



[13]

Author: FOT