IPETRONIK

IPE MOTION
Software

Serial PlugIn

July 2013

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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).

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.**

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1.2   General information

1.2.1   About this manual

This manual describes how to use the Serial PlugIn to interface serial devices with IPEmotion, IPETRONIK's data acquisition software, using a serial protocol. The Serial PlugIn is a general purpose Plugin which basically acts as a container accommodating a device-specific extension DLL to handle the protocol communication. This allows developers to customize the PlugIn and to integrate new devices to display and store data in IPEmotion.

1.2.2   Version

This manual has the version number V01, released [07] [2013]   **© All rights reserved !**

1.2.3   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.*

1.2.4 Support

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Technical support and product information

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2   Overview of the PlugIn

2.1   PlugIn Installation

The Serial Plugin is hosted on the IPETRONIK website www.ipetronik.com. After having installed the PlugIn, you need to restart IPEmotion. A message window will notify you, telling that a new PlugIn was found. After activation, the PlugIn can be used for data acquisition.

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

▸ Setup for the Serial PlugIn

▸ Extension DLL for serial devices which are explained in more detail in chapter 3

▸ Template for the Visual Studio extension DLL development

▸ Documentation & Presentation of how to use of the Serial PlugIn

▸ IPEmotion reference project (.iwf) for Fluke Norma 3000 Power Analyzer

2.2   General configuration of the Serial PlugIn

2.2.1   Create a Serial System

The Serial PlugIn supports data communication to serial devices. In order to configure the communication parameters, the serial PlugIn is selected from the device list.
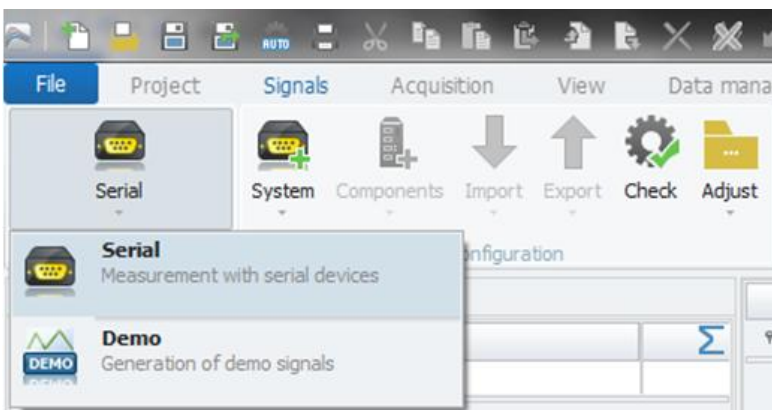
Afterwards, a system with one data channel will be created.
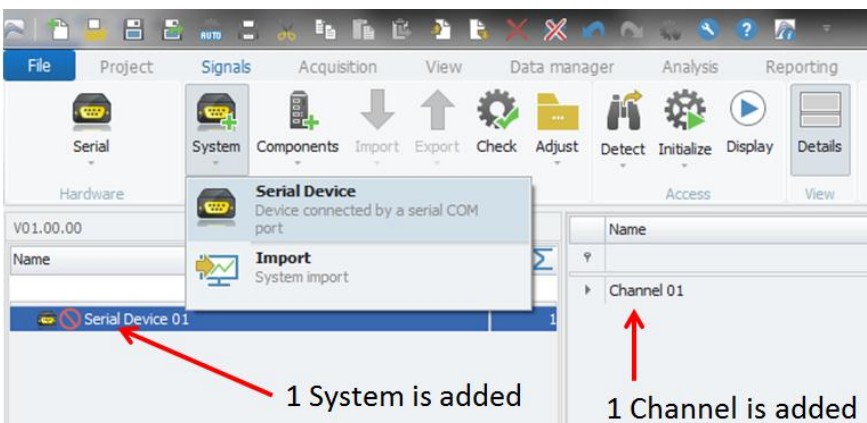
2.2.2 Configuring COM Port interface parameters

After the basic 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".
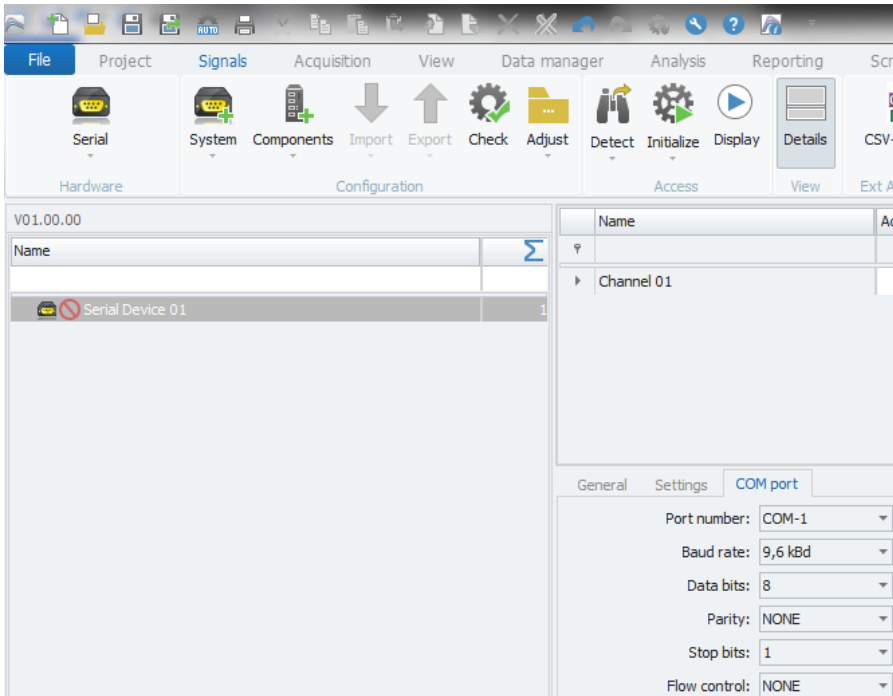
2.2.3 Device-specific DLL and identifier numbers

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 .DLL it is not possible to read data from the serial device.

In order to develop this device-specific DLL, a visual studio development template is available. 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.

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**. This identifier number is specifying which value of the serial device will be shown on this channel. The following screenshot shows a section from the C++ programming where the "PacketIdentifier" is highlighted.

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 transmitted values.
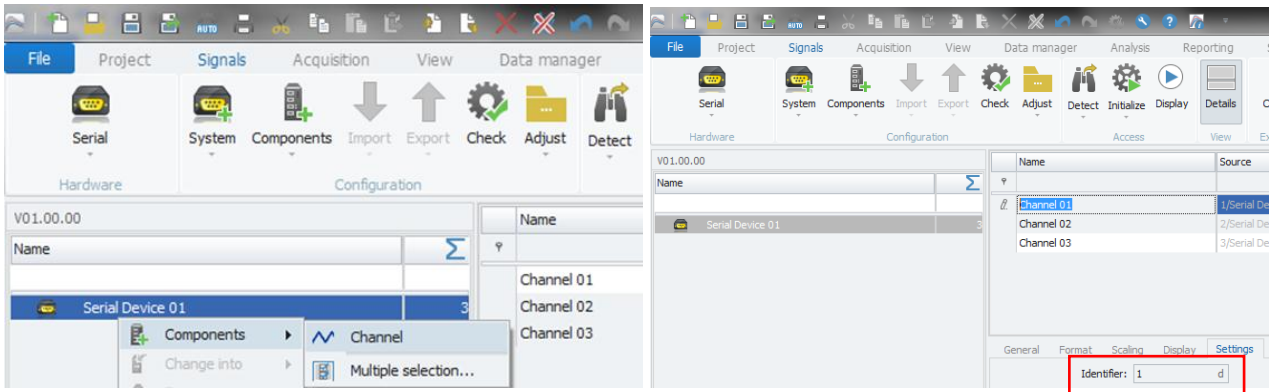
Information   *IPETRONIK provides support for the DLL development.*

Furthermore, IPETRONIK develops the DLL for you on request.

3 Device-specific interface DLL

3.1 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.
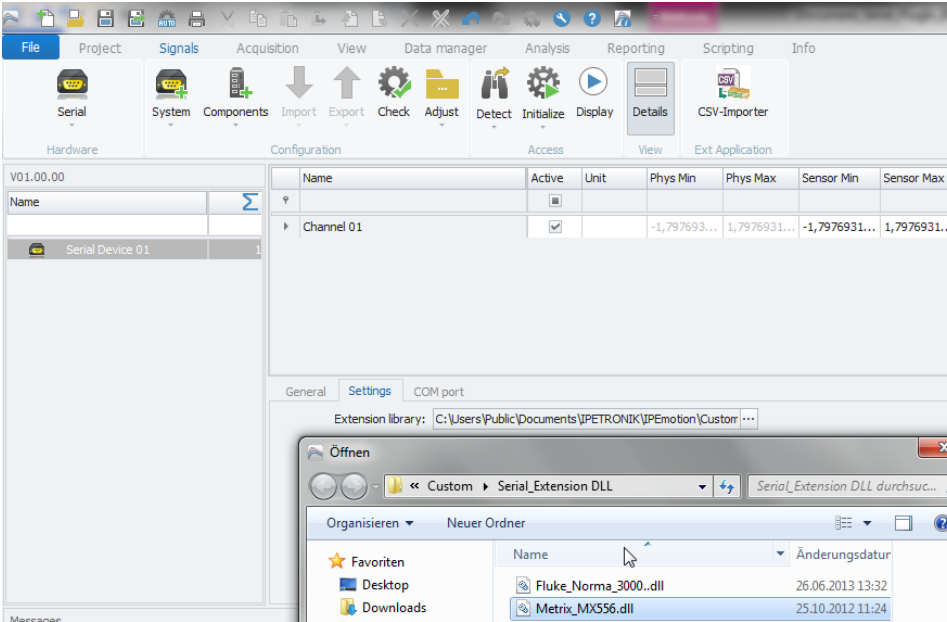
The user can store the DLL in any directory. The PlugIn is searching the default directory on WIN 7 OS: C:\Users\Public\Documents\IPETRONIK\IPEmotion\Custom\

To start the data transfer from the METRIX device, the 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. With no hardware found, an error message is displayed on the lower message window.
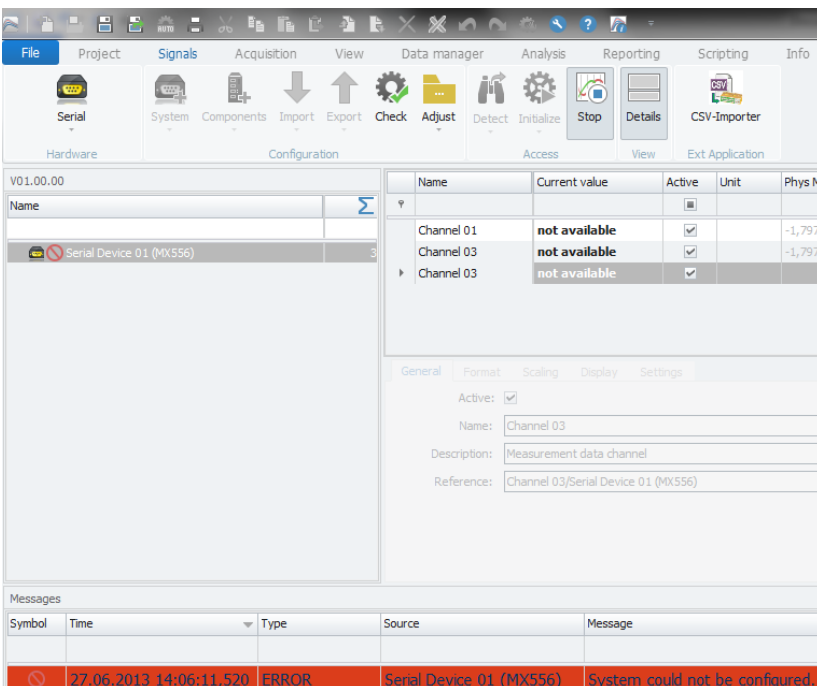
3.2 Fluke Norma 3000 Power Analyzer

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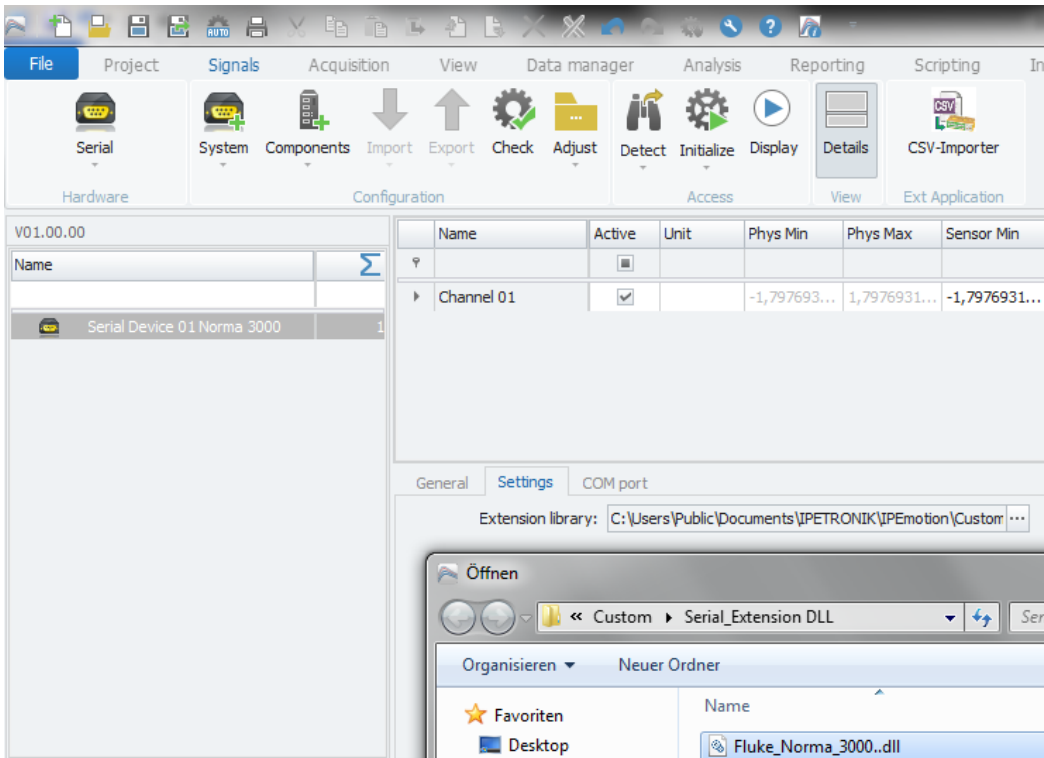
This DLL is supporting 37 different functions which are listed below. If more functions are required, the DLL needs to be updated. Each function has a unique identifier.

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

IPETRONIK
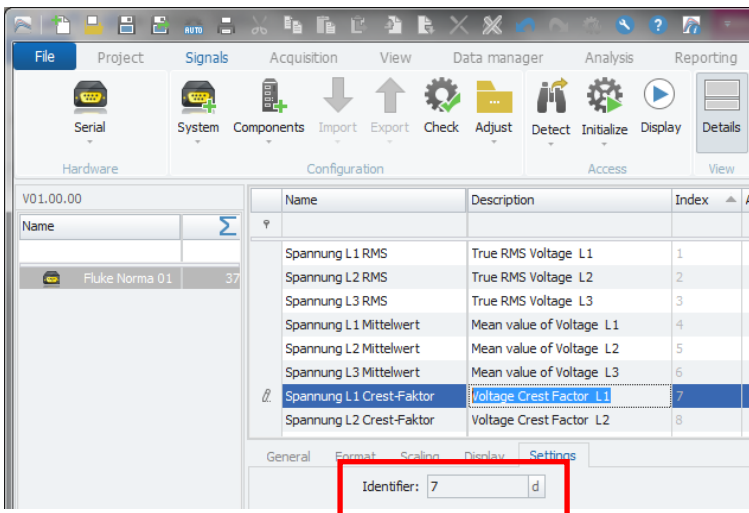
Identifier	Function for Fluke Norma 3000 Power Analyzer
1	True RMS Voltage L1
2	True RMS Voltage L2
3	True RMS Voltage L3
4	Mean value of Voltage L1
5	Mean value of Voltage L2
6	Mean value of Voltage L3
7	**Voltage Crest Factor L1**
8	Voltage Crest Factor L2
9	Voltage Crest Factor L3
10	Voltage THD L1
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

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