

ProfiView

1.7

Communication modules manual

History track:

Ver.	Date	Description
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1. Purpose of this document

The purpose of this document is to understand the logic of configuration of communication modules in ProfiView and reference manual for existing modules in actual version of ProfiView.

2. What is ProfiView

ProfiView is software which can:

Visualize graphically and textually production process, measurement of quantities etc...

Monitors production status, process, running systems etc...

Alarming of unexpected situations, values etc...

Reporting of monitored process or measurement.

ProfiView is a cheap and effective tool with modular architecture, which is possible to use in any area, where you need to visualize or monitor some process or status, where you need regularly report the status or process and alarm unexpected or limit situations/values.

ProfiView, thanks to it's modularity, is able to communicate with any device, which offers digital interface with implemented any communication protocol. You just need to have the right module for ProfiView. ProfiView still extends the device portfolio. Ask for support of your device.

Typical application of ProfiView is connection to industry PLC, e.g. product of OMRON, read memory of PLC, and then visualize them in pictures or text or numbers on the screen.

Example of application: Monitoring and reporting of sewage plant process, monitoring of machine run in production hall and calculation of productivity, monitoring and visualization free parking places.

ProfiView is free to download on <http://profiview.maxpro.cz> (under shareware licence). You can purchase support, installation, configuration, development and more.

2.1. Technical parameters of ProfiView ver 1.07

- Multi OS software (Windows, Linux), tested for Windows XP, Windows Vista
- Easy configuration and application change
- Detailed documentation for installation and project configuration
- Supports PLC with RS232 cable interface
- Supports remote connection via AT modem, AT GSM modem.
- Supports e.g. OMRON PLC with CMODE protocol – for other go to <http://profiview.maxpro.cz>
- Detailed logs of ProfiView activity = easy trouble shooting and analysis
- Possibility to integrate your own communication modules (for developers)
- One installation can handle more implementations/configuration (projects)
- Supports more languages: English, German, Czech
- Free download, under Shareware licence

3. Project XML configuration file

Profiview works with so called projects. How to configure the project is described in ProfiView configuration manual. Here we focus only on certain part of project configuration file and it is section <PLHANDLER>.

Communication modules, are binary files distributed with ProfiView installation embedded somewhere inside ProfiView application libraries. The binaries have specific names, described later in this document. The project XML configuration file has section <PLHANDLER> which has one mandatory attribute called "name". The value of attribute name must exactly fit with name of the binary file. It means the name value is case sensitive.

ProfiView will read the name value during startup and it will try to find out the module in libraries. If it doesn't find the right module with the given name, then will generate a log entry in `profiview.log` file and will not start. If the module is found, then it will load the module and read the relevant configuration section in project XML file inside section <PLHANDLER>.

The subsection inside section <PLHANDLER> must again have the same name like attribute name of PLHANDLER and the binary file. But the section name is not case sensitive. The content of the subsection (the module section) can have variable format. This depends on each module. This document describes configuration of the module section for all distributed modules in this version of ProfiView.

Small example can look like follows:

Binary communication module file name: `AbcDefg`

Then project configuration can look like follows:

```
<PROFIVIEW>
  <PLHANDLER name="AbcDefg">
    <ABCDEFG>
      .
      Some sections according to AbcDefg module manual
      .
    </ABCDEFG>
    .
    Other modules section or nothing
    .
  </PLHANDLER>
  .
  rest of project configuration
  .
</PROJECT>
```

4. Communication modules

In this section we will describe configuration of all existing modules distributed with current version of ProfiView.

4.1.CMode

Module binary file name: "CMode"

This is the basic module implementing CMODE protocol from OMRON. This module communicate with external device, via CMODE protocol using serial line. It is for direct cable connection between PC and PLC module. The configuration defines only parameters of serial line.

In this version of ProfiView is implemented only read function RD and RR to get values from PLC memory. See CMODE manual from OMRON to take details about the commands.

Known configuration parameters, their attributes and / or values:

Parameter name	Possible values	Description
PORT	COMxx	The name of serial line must correspond with name used in operating system. Usually is like COM1 or COM2 or e.g. COM16 etc...
BITRATE	2400 9600 ... 115500	The traditional bitrate. It must correspond with settings in PLC.
DATABITS	7 or 8	Is a number saying number of bits used for data. The settings must correspond with PLC settings.
PARITY	0 - no parity, 1 - even 2 - odd 3 - mark 4 - space	Is a number saying whether parity is even or odd or no parity. Values like mark or space are used very rarely. The settings must correspond with PLC settings.
STOPBITS	1 – one stop bit 2 – two stop bits, 3 – 1.5 stop bits	Is a number saying number of bits used as stop bits. The settings must correspond with PLC settings.
FLOWCONTROL	1 – none 2 – RTSCTS 3 - RTSCTS – IN 4 - RTSCTS – OUT 5 – XONXOFF 6 - XONXOFF – IN 7 - XONXOFF - OUT	Is a number saying what type of flowcontrol will be used. The settings must correspond with PLC settings.

Example:

```
<PLCHANDLER name="CMode">
  <CMODE>
    <PORT>COM6</PORT>
    <BITRATE>9600</BITRATE>
    <DATABITS>8</DATABITS>
    <PARITY>0</PARITY>
    <STOPBITS>1</STOPBITS>
    <FLOWCONTROL>1</FLOWCONTROL>
  </CMODE>
</PLCHANDLER>
```

4.2. DummyPlc

Module binary file name: "DummyPlc"

This is dummy module implementing CMODE protocol from OMRON. This module doesn't communicate via any interface to any device. This just simulates reading from memory, where it generates random value between 0 and 10 on the first request and then it will increment this number with each reading of the same address position. If value 10 is reached, then it will return 0 by next reading. This module is used usually for starting preparing of new project. This module doesn't need any configuration, just the empty (or not empty) section is must exist.

In this version of ProfiView is implemented only read function RD to get values from PLC memory. See CMODE manual from OMRON to take details about the commands.

Example:

```
<PLCHANDLER name="DummyPlc">  
  <DUMMYPLC>  
  </DUMMYPLC>  
</PLCHANDLER>
```

4.3. CModePlcModem

Module binary file name: "CModePlcModem"

This is the advanced module implementing CMODE protocol from OMRON and implements also modem handling. This module communicate with external device, via CMODE protocol using serial line connected directly to modem. Thanks to this module you can monitor remote PLC device.

Beside definition of the parameters for the serial line (connection to modem device), you have to specify also series of AT commands needed to dial in a number and connect to remote modem. The remote modem must answer automatically. If the modem answers, then ProfiView will start to use CMODE protocol to talk to the device. If the connection attempt anyhow fails, then ProfiView will try to connect again. There are 3 retries before it says that connection is not possible.

Inside the section for this module must exist parameters for serial line, but also section <CONNECT> and section <DISCONNECT>. Connect section is used for initializing of the connection and section disconnect is used to hangup the connection. Inside these sections should exist the commands, which can have some attributes and values. See the tables below.

In this version of ProfiView is implemented only read function RD and RR to get values from PLC memory. See CMODE manual from OMRON to take details about the commands.

Known configuration parameters, their attributes and / or values for serial line configuration:

Parameter name	Possible values	Description
PORT	COMxx	The name of serial line must correspond with name used in operating system. Usually is like COM1 or COM2 or e.g. COM16 etc...
BITRATE	2400 9600 ... 115500	The traditional bitrate. It must correspond with settings in PLC.
DATABITS	7 or 8	Is a number saying number of bits used for data. The settings must correspond with PLC settings.
PARITY	0 - no parity, 1 - even 2 - odd 3 - mark 4 - space	Is a number saying whether parity is even or odd or no parity. Values like mark or space are used very rarely. The settings must correspond with PLC settings.
STOPBITS	1 – one stop bit	Is a number saying number of bits used

	2 – two stop bits, 3 – 1.5 stop bits	as stop bits. The settings must correspond with PLC settings.
FLOWCONTROL	1 – none 2 – RTSCTS 3 - RTSCTS – IN 4 - RTSCTS – OUT 5 – XONXOFF 6 - XONXOFF – IN 7 - XONXOFF - OUT	Is a number saying what type of flowcontrol will be used. The settings must correspond with PLC settings.

The following table defines known configuration parameters, their attributes and / or values for <CONNECT> and <DISCONNECT> section. Inside both these section is each command closed in subsection <MODEM_COMMAND>. Inside this subsection is defined <COMMAND> and <ANSWER>. This module reads definition of the command and definition of the answer. Commands is sent to modem and module waits for response. Once response is received, it is compared to configured response. If it matches, then it process another command if is configured. If the response doesn't match the configured <ANSWER> then it is treated as error and module will try to connect again from beginning.

Parameter name	Attributes	Possible values and description
COMMAND	eol	„yes“ - it means that module will send afte this command „end of line“ characters to modem. The end of line characters are 0x0D 0x0A. „no“ - it means, that end of line characters after command are not sent to modem.
ANSWER	type	„substring“ - Expects defined answer as substring of response from modem. „wholestring“ (or nothing) – Expects exact match of define answer with response from modem.
	timeout	Number in milliseconds how long the module waits for response from modem. If it times out, then module try to connect again from the begining. If the parameter is missing, then default values is 15000, it is 15sec.

Example:

```
<PLCHANDLER name="CModePlcModem">
  <CMODEPLCMODEM>
    <PORT>COM16</PORT>
    <BITRATE>9600</BITRATE>
    <DATABITS>8</DATABITS>
    <PARITY>0</PARITY>
    <STOPBITS>1</STOPBITS>
    <FLOWCONTROL>1</FLOWCONTROL>
    <CONNECT>
      <MODEM_COMMAND>
        <COMMAND eol="yes">AT</COMMAND>
        <ANSWER type="substring" timeout="30000">OK</ANSWER>
      </MODEM_COMMAND>
      <MODEM_COMMAND>
        <COMMAND eol="yes">ATS6=1</COMMAND>
        <ANSWER>OK</ANSWER>
      </MODEM_COMMAND>
      <MODEM_COMMAND>
        <COMMAND eol="yes">ATDT123456789</COMMAND>
        <ANSWER timeout="20000" type="substring">CONNECT</ANSWER>
      </MODEM_COMMAND>
    </CONNECT>
    <DISCONNECT>
      <MODEM_COMMAND>
```

```

        <COMMAND eol="no">+++</COMMAND>
        <ANSWER type="substring" timeout="15000">OK</ANSWER>
    </MODEM_COMMAND>
    <MODEM_COMMAND>
        <COMMAND eol="yes">AT</COMMAND>
        <ANSWER type="substring" timeout="10000">OK</ANSWER>
    </MODEM_COMMAND>
    <MODEM_COMMAND>
        <COMMAND eol="yes">ATH</COMMAND>
        <ANSWER type="substring" timeout="10000">OK</ANSWER>
    </MODEM_COMMAND>
</DISCONNECT>
</CMODEPLCMODEM>
</PLCHANDLER>

```

4.4. CModeSerialDummy

Module binary file name: "CModeSerialDummy"

This is dummy module which implements CMODE protocol, opens serial line on computer, will send out CMODE command to serial line, will wait for reply, but will ignore the reply and returns back some random value. This is mostly used for debugging of serial line to PLC. The configuration defines only parameters of serial line.

In this version of ProfiView is implemented only read function RD and RR to get values from PLC memory. See CMODE manual from OMRON to take details about the commands.

Known configuration parameters, their attributes and / or values:

Parameter name	Possible values	Description
PORT	COMxx	The name of serial line must correspond with name used in operating system. Usually is like COM1 or COM2 or e.g. COM16 etc...
BITRATE	2400 9600 ... 115500	The traditional bitrate. It must correspond with settings in PLC.
DATABITS	7 or 8	Is a number saying number of bits used for data. The settings must correspond with PLC settings.
PARITY	0 - no parity, 1 - even 2 - odd 3 - mark 4 - space	Is a number saying whether parity is even or odd or no parity. Values like mark or space are used very rarely. The settings must correspond with PLC settings.
STOPBITS	1 – one stop bit 2 – two stop bits, 3 – 1.5 stop bits	Is a number saying number of bits used as stop bits. The settings must correspond with PLC settings.
FLOWCONTROL	1 – none 2 – RTSCTS 3 - RTSCTS – IN 4 - RTSCTS – OUT 5 – XONXOFF 6 - XONXOFF – IN 7 - XONXOFF - OUT	Is a number saying what type of flowcontrol will be used. The settings must correspond with PLC settings.

Example:

```
<PLCHANDLER name="CModeSerialDummy">  
  <CMODESERIALDUMMY>  
    <PORT>COM6</PORT>  
    <BITRATE>9600</BITRATE>  
    <DATABITS>8</DATABITS>  
    <PARITY>0</PARITY>  
    <STOPBITS>1</STOPBITS>  
    <FLOWCONTROL>1</FLOWCONTROL>  
  </CMODE>  
</PLCHANDLER>
```