

## Version 2.0 Update notes

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### 1.a) Java applets for rapidly changing PLC data display in HTML pages:

The new "Example11" shows the usage of Java applets. Java applets can help improve the behavior of your HTML pages. A Java applet only needs a few microseconds to request and display PLC data. Each Java Applet only has to redraw its own, small window within the HTML page to show and enter PLC data. The included Java applet library MEW.JAR (Beta version 0.7) enables you to use multiple Java applets with different functions in one HTML page to visualize PLC data. Please use the PLC program from Sub-folder "PLC program" for this example. In sub-folder "Documents" details on the Java applet parameters are provided.

Note: If the Java applets do not start, please check if the "SUN Java 2 Runtime Environment" (JRE) is installed on your computer. The JRE can be installed via FP-Web-Configurator-Tool CD-ROM or downloaded at "[http://java.sun.com/products/archive/j2se/1.4.1\\_02/index.HTML](http://java.sun.com/products/archive/j2se/1.4.1_02/index.HTML)"

### 1.b) Java applet archive manager:

We included a Java archive manager to remove functions not used from a Java applet library archive file. In the new "Example11" we included the Java applet library file "MEW.JAR" which contains all Java applet functions. This .JAR file can be edited via the "Web" section of the FP-Web-Configurator-Tool (doubleclick MEW.JAR). Or while in the file explorer use the right mouse button and select "edit". The original .JAR file is backed up in a new sub-folder "Org\_Jar".

For example, the MEW.JAR archive contains the following functions:

MEWcom.class	Always needed for PLC communication
DataReg.class	Needed for data register applet
DataReg\$KeyEntry.class	"
DataReg\$RemindTask.class "	
Relay.class	Needed for relay register applet
Relay\$RemindTask.class	"
TrendGrf.class	Needed for trends graph applet
TrendGrf\$RemindTask.class "	

### 2.a) PLC data as email attachment:

It is now possible to generate an email with an attached file holding PLC data. The PLC data is saved in a CSV (MS Excel) compatible file and sent along with the email text. The PLC register range to be read and saved in the attachment and the file name can be defined in a special tag string. This tag string is placed in the email text directly after the SUBJECT and TO statements, i.e. in a separate text line directly before the email text. The format of the special tag string is:

{A\_D\_00200\_00066\_S04\_file.csv}

The parameters in this tag string have the following meanings:

- + 0: Tag must start on line with '{A\_'
- + 3: Register type D=DT F=FL L=LD
- + 5: First register address to read
- +11: Number of registers to read
- +17: CSV terminator K=',' S=';'
- +18: Number of CSV columns
- +21: Attachment file name till '}'

### 2.b) Example2 modified to show email attachments:

The Example2 demo project was modified to show the new attachment function. The first email text (stored within the FP Web-Server) was changed in the following way:

SUBJECT: Email text plus attachment

TO: Person1

{A\_D\_00200\_00066\_S04\_file.csv} <-- Attachment Tag

Tag must start on first position of line.

After SUBJECT, TO lines and before the email text.

In this example DT200...DT266 is sent to the email recipient in a CSV compatible file named 'file.csv'

### 3.a) MEWTOCOL port server with password protection:

The MEWTOCOL port server can now be optionally setup with connect password security. When a client (FPWIN, PCWAY, Java Applets ...) connects to the MEWTOCOL port, the string "Password: " is sent back to the client. Then the client should send the password (followed by a CR code) to the server. If the server accepts the password, the MEWTOCOL communication can start. Otherwise the server closes the TCP connection. The password transfer from the client to the server can optionally be encoded.

### 3.b) MEWTOCOL Port Server with IP lock security:

The MEWTOCOL port server now checks the client's IP address if the new IP lock security function is enabled. An incoming connect request is not accepted if the client's IP address is not listed in the configuration. There are two modes for setting up the allowed IP addresses:

- a.) Two individual client IP addresses can be specified:  
For example: Only 10.10.13.17 and 199.199.26.88 are accepted
- b.) Or a range of client IP addresses can be enabled:  
For example: From 168.172.13.16 to 168.172.13.74 is allowed

Additionally the character '\*' can be used to allow ALL possible sub-addresses in parts of the IP address. For example: All the IPs 10.10.13.\* and 199.199.26.\* are acceptable

### 3.c) Internet security: Close the configuration interfaces (FTP, Telnet):

The FP Web-Server unit normally supports FTP (File transfer) and Telnet (Remote control) communication connects. These two protocols are used by the FP-WEB Configurator Tool during the unit configuration process. But if the unit is connected to the Internet by a router with no firewall, the data security can be increased by disabling the FTP and Telnet ports. This can be done with the FP-WEB Configurator Tool by holding the <ALT> key while clicking on the "Send" button. Before the unit is locked the following warning message is displayed:

"Transfer the final configuration and lock the unit for further configuration changes? The FTP and Telnet ports are disabled after this transfer and reboot of the unit. Note: Only a service reset (via DIP switches) will again enable a reconfiguration. Really lockup the remote FP Web-Server unit after final configuration transfer?"

4.a) FP Web-Server can deliver XML files:

Now the FP Web-Server's Http server can also deliver PLC data within XML files. Similar to an HTML file, the XML file can include the special PLC data tag {TTxxxy\_aa\_bb}. This tag is replaced by the actual PLC data at the time the XML file is requested from a client in the form "http://199.199.26.52/plc?filename.xml" (for details, see "Http-Functions" in the manual). Below please find some general XML explanations and a demo sample.

4.b) New: Example14 shows how to use XML files:

This new example demonstrates how to generate a XML file with PLC data. The Microsoft Internet Explorer and some XSL files are used to display XML data within an HTML page.

General Info:

The XML file format is a sort of ASCII text file designed for data exchange (data import/export, data base interface ...). An XML file holds only structured data and not style or format information. An XSL file with style and format information is needed to transform an XML into a different file (display) format. The "transformNode()" function of the Microsoft Internet Explorer is used to take the XML data and an XSL format definition to generate a HTML page.

4.c) HTML pages / PLC data: Display of integers with decimal point:

It is now also possible to display PLC integer data with a decimal point.

The format specification "[flags][width][.precision][l]type" is now interpreted differently for decimal integer types: 'd' 'i' 'u' 'o' 'x' 'X'

(and l i l u l o l x l X). The number of decimal places can be defined for 16-bit and 32-bit integers with the '.precision' (range 1...9). For example:

Format	PLC value	Display
{DT201_7_.3i}	DT201=1234	1.234
{DT201_6_.4d}	DT201= -12	-0.0012
{DT201_7_05.2d}	DT201= 12	000.12
{DT201_16_.4lu}	DDT201= 12	0.0012
{DT201_5_.2X}	DT201= 12	0.0C

NOTE: In previous versions the new format notation was interpreted differently:

Format	PLC value	Display	
{DT201_6_.3d}	DT201= 12	012	old version
{DT201_6_.3d}	DT201= 12	0.012	new version
{DT201_6_03d}	DT201= 12	012	old and new version

Example13 demonstrates this new HTML feature.

4.d) HTML pages / PLC data: Now also hex data values can be entered:

In the HTML submit function, the format type characters 'x' and 'X' are allowed for hexadecimal PLC data entries. Hex data entries are possible for 16-bit (name="DT200\_6\_X") and 32-bit (name="DT300\_16\_lx") PLC data registers.

For example, enter a 16-bit hex value for DT210:

```
<form action="/plcpost" method="POST" target="SUBWIN"
onsubmit="opensubwin(200,100);">
```

Enter DT210 <input SIZE="6" name="DT210\_6\_X"> in hex</form>

Example13 demonstrates this new HTML feature.

4.e) HTML pages / PLC data: Entry of integer data values with decimal point:

The new '.precision' (range 1...9) format specification for integer values is also valid for PLC data entry via HTML submit function. It is now possible to enter a floating-point value with a decimal point, which is stored as a 16-bit or 32-bit integer in the PLC data register. For example:

Entry format	User entry	Data in PLC register
DT201_6_.2d	12.3	DT201= 1230 (04CE hex)
DT201_6_.2i	-1	DT201= -100 (FF9C hex)
DT201_6_.1u	12.345	DT201= 123 (007B hex)
DT201_16_.5li	123.4567	DDT201=12345670 (00BC6146 hex)

Example13 demonstrates this new HTML feature.

4.f) New: Example13 demonstrates new HTML features:

This sample shows the new HTML functions described above:

- Hex PLC data entry
- PLC integer data entry with decimal point
- PLC data display with decimal point

4.g) IP lock security of HTML pages enhanced:

Besides password protection for an HTML page (see {PW\_xxx} tag in the manual), it is possible to allow only specific client addresses to access an HTML page. The tag {PW\_a.b.c.d} can be used within an HTML page to specify the allowed client IP addresses (IP address of the computer where the Internet browser is running). The enabled IP address "a.b.c.d" can be a single address like 192.168.200.55 or it can define an address range by using '\*' character. For example, the tag {PW\_192.168.200.\*} allows clients with an IP address from 192.168.200.1 to 192.168.200.254 to access the protected HTML page.

5.a) New dialog for continuous Internet connections (via GPRS):

In the "Dial-Out" section we included a new check box to enable continuous Internet dial-up connections. When activated the FP Web-Server can stay online and connected to the Internet after sending an Internet email. This is especially useful for GPRS connection (only transferred data is paid) to access the HTML pages of the FP Web-Server via Internet.

The PLC can control this function via relay R22. With each (GPRS) dial-up the FP Web-Server gets a different Internet IP address. The actual Internet IP address is also saved in the 32-bit PLC data register DDT102 (0.0.0.0 means not connected). The PLC register address definition (default R22 and DDT102) can be changed in the email section.

Please also see the new 'Example12' for a configuration example, PLC program and a detailed description.

5.b) New: 'Example12': Continuous GPRS Internet connection:

The new configuration example also includes a PLC program and some documentation to demonstrate the following new functions:

- a.) A continuous Internet connection is established via a GPRS module
- b.) The PLC connected to the FP Web-Server can monitor the online status
- c.) When the Internet connection is broken accidentally, the PLC reestablishes it
- d.) The PLC program reports a new Internet IP address to a master station (via email)
- e.) The master station can thus request HTML pages from the FP Web-Server via Internet

5.c) DNS server IP addresses fixed or updated upon modem connects:

You can use a DNS server to access the email server by name instead of directly using its IP address. With BIOS version 1.03 it is possible to get the IP address of the DNS server at the time the modem connects to an Internet service provider. I.e. the fixed DNS address defined in the FP-Web-Configurator-Tool is automatically updated with an Internet modem connect. This automatic DNS server IP address update can now be disabled for special configurations (needed for some GPRS connects). See checkbox "Allow update on modem connect" in the email server settings.

5.d) Periodic communication tests for continuous Internet connections:

In the Dial-Out section it is now possible to enable a periodic communication test for continuous (GPRS) Internet connections. The interval between connect tests can be set up in the range from 1...255 minutes. Most GPRS providers deactivate a GPRS connection if no data is transferred for 25 minutes (Germany) or 20 minutes (Italy). With each periodic test the primary DNS server is accessed (SMTP name resolution). About 64+130 bytes are transferred with each test. In case a communication problem is detected, the Internet connection is aborted and the PLC info register is set to zero.

5.e) Communication tests with DNS requests:

For continuous Internet connections (Router, VPN, GPRS ...) it is sometimes necessary to test the communication, e.g. to test the availability of radio connections or to distribute the end unit's IP address after a restart in case bridges or routers are used. In such cases the DNS request function for email sending can be used. The PLC should periodically try to send an email ... but the email recipient address should not be set (empty string). Then a DNS request is sent by FP Web-Server (after an optional Internet dialup), which tests the communication. Do not forget to set up the FP Web-Server with a valid email server name and existing DNS server IP address.

5.f) User-definable modem init command (PPP-Server):

In the PPP-Server section an optional, additional, user-definable modem initialization command can be entered. It should start with AT and does not need a CR at the end. The maximum length of the modem command is 25 characters. This modem command is sent to the modem when the unit is booted and after terminating an online connection. The answer from the modem (OK or ERROR) is not checked.

5.g) User-definable modem init command with optional delay (PPP-Client):

In the PPP-Client section (dial out settings for Internet connections) an optional, additional, user-definable modem initialization command can be entered. It should start with AT and does not need a CR at the end. The maximum length of the modem command is 59 characters. The modem command is sent to the modem before the dialup command. The answer from the modem (OK or ERROR) is not checked. Also an optional delay (1 ... 65 seconds) following the user modem command can be specified. The optional delay is inserted after the user modem command and before the dialup command.

6.a) The PLC clock can be synchronized with a network time server:

In most LANs a Network Time Server (SNTP) is available to synchronize the real-time clock (RTC) and calendar date of the network units (computers). Such SNTP servers provide accurate world date/time information in UTC format (Universal Time Coordinate). The FP Web-Server can request the current UTC time from the SNTP server. Optionally the FP Web-Server can calculate the local time with a daylight saving time (DST) offset. And then the FP Web-Server can update the date/time RTC registers within the PLC. The update of the PLC clock can be done independently of the PLC program in constant time intervals. Additionally the FP Web-Server can be set up in this way so that a PLC-controlled internal relay (polled every 6 seconds) can trigger a PLC clock update. The FP Web-Server can also save clock information in a user-definable DT register address. This is especially useful for PLCs having no integrated RTC. Two example settings for DST calculation:

```
# Time regulations in Germany: UTC Offset Standard Time: +1:00 h
  Adjustment DST: DST = Standard Time + 1 h
  DST begin: Last Sunday of March
  DST end: Last Sunday of October at 3:00 Local time
# Time regulations on the US East coast: UTC Offset Standard Time: -5:00 h
  Adjustment DST: DST = Standard Time + 1 h
  DST begin: First Sunday of April
  DST end: Last Sunday of October at 2:00 Local time
# Time regulations in Japan: UTC Offset Standard Time: + 9:00 h
  No Daylight Saving Time (DST)
# For more information see:
  http://www.worldtimezone.com/
  http://www.twinsun.com/tz/tz-link.htm
  http://www.weltzeituhr.com/
```

Note: Please be aware that an enabled SNTP module takes up about 11kB of the FP Web-Servers FLASH memory.

6.b) Example15: PLC clock synchronization via Internet NTP server:

The NTP (Network Time Protocol) function of the FP Web-Server is mainly designed to request the current time from an NTP server located in the LAN to update the PLC clock. Example15 shows how to dial up the Internet, request time from an Internet NTP server and hang up the Internet connection after updating the PLC clock. This procedure is managed by the PLC program included. Please find more information and step-by-step instructions in the ReadMe.Txt file of Example15.

Note: Public NTP Servers are free Time Servers. All provide the same UTC time. But ... do not rely on them! Any Internet Public Time Server, Free NTP Server or Free SNTP Server can be periodically switched off or set inaccurately for testing purposes. Therefore they should not be used for any business purposes.

6.c) IEC60870-5-101 balanced mode:

A new button "Advanced IEC60870-5-101 Parameters" was included in the IEC60870-5-101 dialog of the FP-Web-Configurator-Tool, which allows the balanced IEC60870-5-101 mode to be used. Also, the two new parameters for the balanced mode can be entered:

- TIMEOUT (default 3000ms) Wait on ACK after sending data (100...120000ms)
- RETRY (default 3) No. of data send retries after timeout (0...32000)

6.d) Direct PLC MEWTOCOL communication via an IEC60870-5-101 interface:

If the 9-pin RS232C port is set up for IEC60870-5-101 communication, MEWTOCOL communication can take place. The IEC60870 polling from the central station must be stopped before MEWTOCOL communication can be used. MEWTOCOL commands are sent directly to the PLC. This version only allows short (standard) MEWTOCOL commands. Perform the following steps to disable extended MEWTOCOL commands for FPWIN Pro:

- Locate file: C:\Programme\NAiS MEWNET\NAiS\_MewPLC.DAT
- Open NAiS\_MewPLC.DAT with a text editor (notepad)
- Find the section for your PLC. For example [FPSIGMA] or [FP2]
- In this section set the parameter EXTCMD=0 to zero
- Save changed file NAiS\_MewPLC.DAT
- Restart FPWIN Pro

6.e) UDP multipoint port configuration improved:

It is now possible to select different modes for receiving data in UDP multipoint transparent port.

The data tag {iwww.xxx.yyy.zzz} informs the receiving station about the IP address of the sending station. The generation of this special data tag can now be set up in the following ways:

- Tag generated if the IP address of the sender has changed (as with V1.3)
- Tag inserted before every data packet received
- The special data tag is not generated (no sender IP info)

6.f) MEWTOCOL port server with ET-LAN protocol:

The MEWTOCOL port server can now also handle ET-LAN (ET1) communication protocol. These two protocols are automatically detected and may be different for each of the three possible clients.

This is especially useful for communication with the GV series touch panels, for example.

6.g) Configurator entry screens optimized:

The DNS and Internet dial-up settings have been removed from the email server section and moved to new, separate entry screens:

- DNS settings moved to the general configuration (DNS button)
- Internet dial-up settings moved to a new 'Dial-out' section

6.h) Minor improvements and bug repairs:

- MEWTOCOL and transparent port number range: 1...32767
- FTP connect optimized. FTP parameter read from TOOL.INI
- IP address not changed on master reset:  
If a service reset is done (DIP switch 2+4) the configuration (including passwords) is cleared, but not the IP address of the unit.
- Email handling and procedure was improved:  
Email recipient address and text are checked after the DNS request.  
If login is disabled, no DNS request is performed for the POP3 server.
- Firmware start-up sequence was improved:  
Even if there is a corrupt CHIP.INI file, the service reset procedure (DIP switch 2+4) to clear the password by deleting the CHIP.INI is called.
- IEC60870-5-101 balanced mode test command implemented:  
In IEC60870-5-101 balanced mode, the command function 2 (Test) can be used from the central station. The IEC60870 Communicator answers with single character ACK.
- Project path display in the HTML tab optimized
- English texts optimized