eWon drivers

CP SISTEMI

PRODUCTIVE PROCESS SOFTWARE

www.ewondrivers.com

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1. Preface

The **eWon drivers eXtender** provides eWON devices with a flexible solution for extending communication protocols. The software is installed directly into eWON device and can be controlled by the native web interface. For sake of simplicity the configuration is done via web interface, in the same way you setup an eWON TAG.

For each communication driver we provide a sample set of TAG already configured and ready to use.

This software can be evaluated in **demo mode** for 10 minutes from the eWON's startup.
To enable demo mode you need to generate a demo license file for your eWON. To get a license file please visit www.ewondrivers.com

IMPORTANT

If

a) you modify and save any tag's parameter (description, address, etc.) while **eWon drivers eXtender** is running and
b) you are using a driver that is able to write the tag value to field and
c) the global writing flag is enabled

then this will cause the driver to write a "zero" value to the tag's value and so to the field.

In order to avoid this behavior you have two options:

1. Disable the global writing flag during the tag setup phase. Please refer to chapter 3.5.3 Command TAG.
2. Stop **eWon drivers eXtender** during the tag setup phase. Please refer to chapters 2.6 Start and Stop commands and 3.5.3 Command TAG.

Drivers capable of writing tag values to field are available for **eWon drivers eXtender** version 4.0 and above. Please refer to the specific driver documentation to know if it is capable of writing tag values to field.

2. Installation

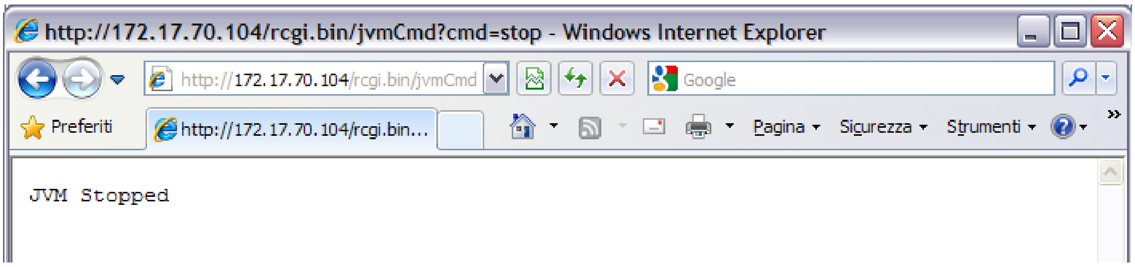
The installation phase consists of five steps:

1. File transfer
2. TAG Setup (driver's specific sample file)
3. First run
4. License Key
5. Start and Stop commands

2.1. Remove previous version

Before installing a new **eWon drivers eXtender** release you need to remove the previous installed version, if any. To do this you need to stop the JVM:

STOP:
http://*IP-eWon*/rcgi.bin/jvmCmd?cmd=stop


http://172.17.70.104/rcgi.bin/jvmCmd?cmd=stop - Windows Internet Explorer
http://172.17.70.104/rcgi.bin/jvmCmd
Google
Preferiti
http://172.17.70.104/rcgi.bin...
Pagina
Sicurezza
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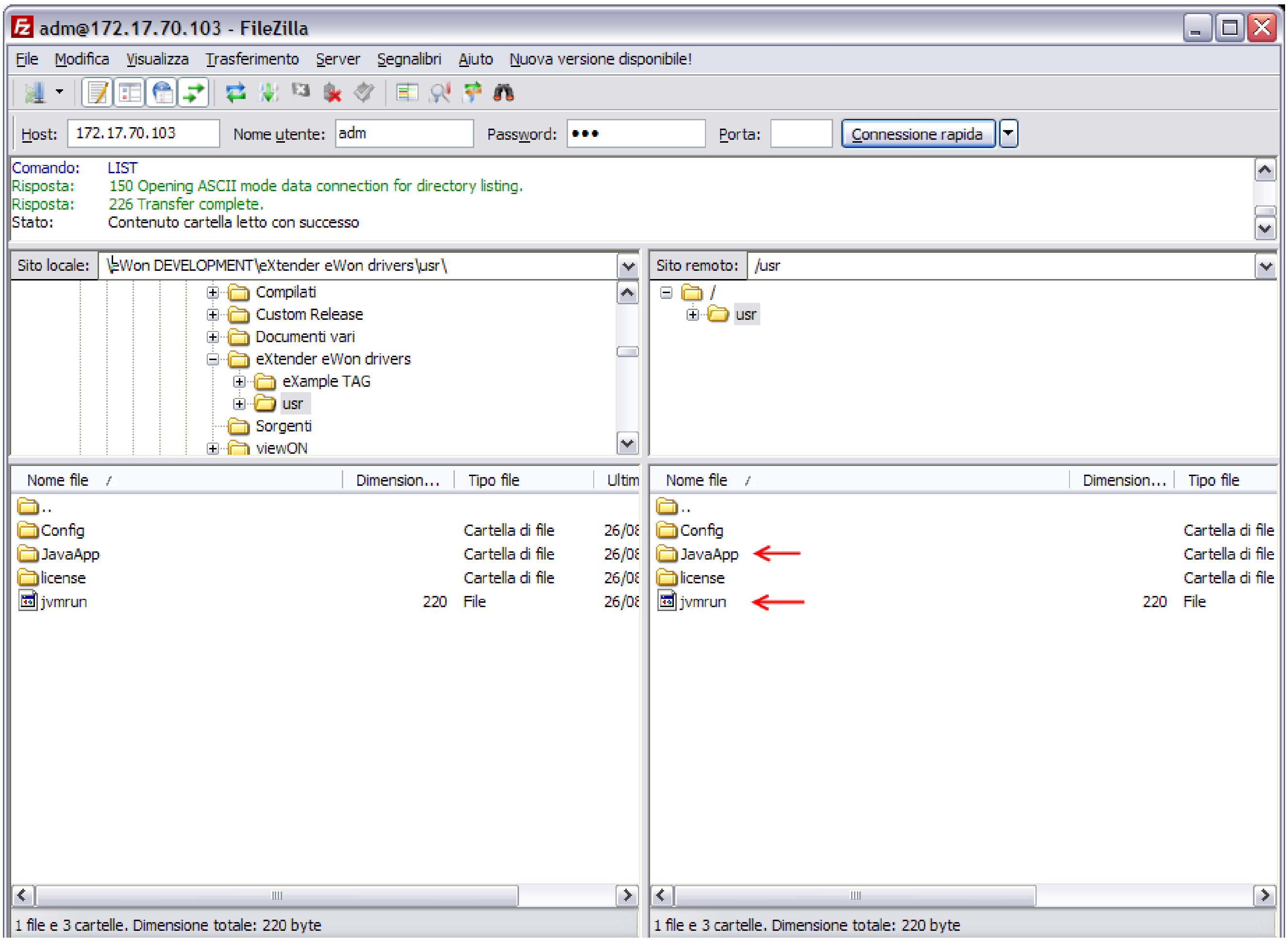
```
JVM Stopped
```

and delete the following contents that you can find under /usr directory using an FTP client like Filezilla:

- JavaApp
  - Directory with **eWon drivers eXtender**.
- Jvmrun
  - If this file exists **eWon drivers eXtender** starts when eWON starts.


adm@172.17.70.103 - FileZilla
File Modifica Visualizza Trasferimento Server Segnalibri Aiuto Nuova versione disponibile!
Connessione rapida

Host: 172.17.70.103 Nome utente: adm Password: ••• Porta:

```
Comando:    LIST
Risposta:   150 Opening ASCII mode data connection for directory listing.
Risposta:   226 Transfer complete.
Stato:      Contenuto cartella letto con successo
```

Sito locale: \eWon DEVELOPMENT\eXtender eWon drivers\usr\

- Compilati
- Custom Release
- Documenti vari
- eXtender eWon drivers
  - eXample TAG
  - usr
- Sorgenti
- viewON

Nome file	Dimension...	Tipo file	Ultim
..			
Config		Cartella di file	26/08
JavaApp		Cartella di file	26/08
license		Cartella di file	26/08
jvmrun	220	File	26/08

1 file e 3 cartelle. Dimensione totale: 220 byte

Sito remoto: /usr

- /
  - usr

Nome file	Dimension...	Tipo file
..		
Config		Cartella di file
JavaApp		Cartella di file
license		Cartella di file
jvmrun	220	File

1 file e 3 cartelle. Dimensione totale: 220 byte

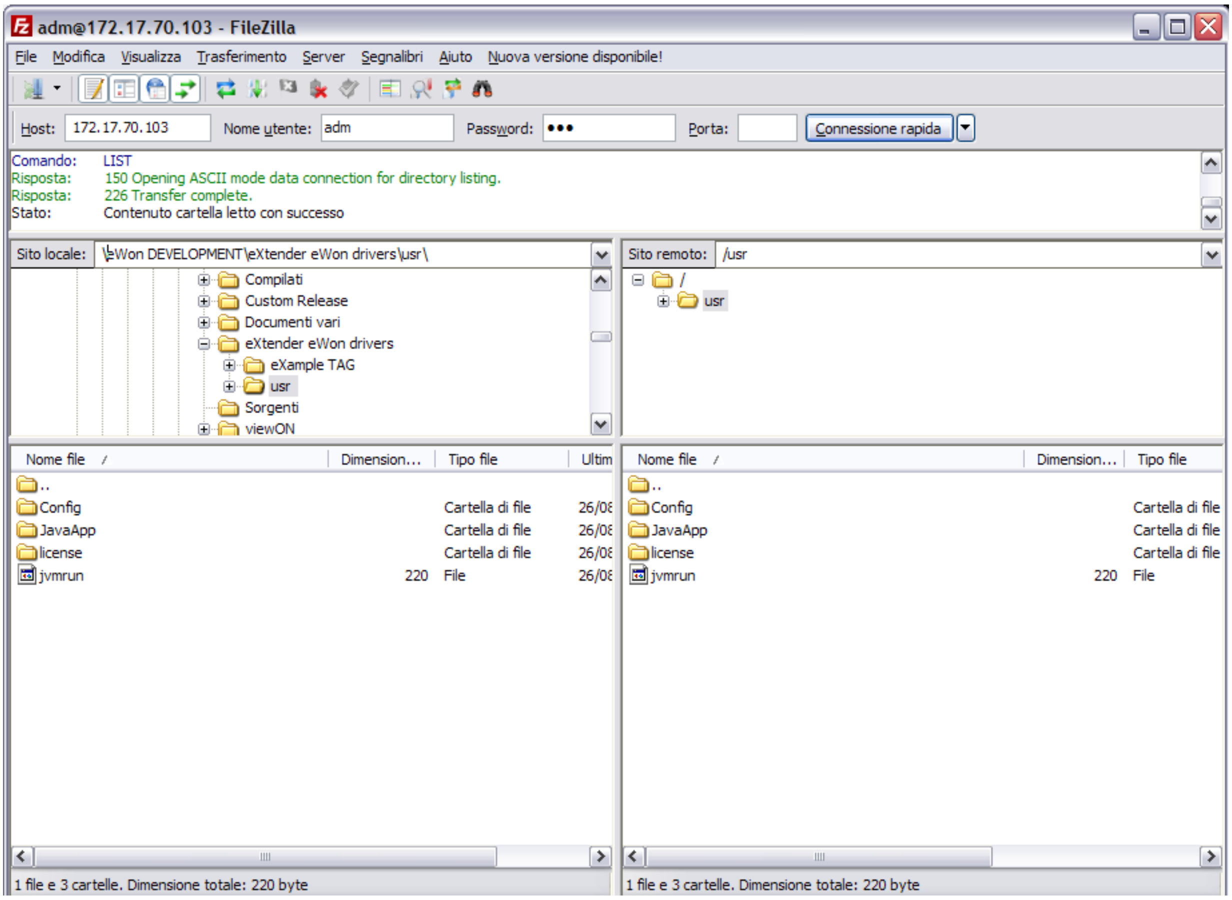
2.2. Installation

Extract the **eWon drivers eXtender** archive and upload the **"usr"** directory content in the eWON's **"/usr"** directory using an FTP client like Filezilla.

<u>Usr's contents:</u>

- Config
  - Directory with CSV file for custom TAG configuration.
- JavaApp
  - Directory with **eWon drivers eXtender**.
- license
  - Directory with license files.
- Jvmrun
  - If this file exists **eWon drivers eXtender** starts when eWON starts.

At the end of the transfer you should be in this state:


adm@172.17.70.103 - FileZilla
File Modifica Visualizza Trasferimento Server Segnalibri Aiuto Nuova versione disponibile!
Connessione rapida

Host: 172.17.70.103 Nome utente: adm Password: ••• Porta:

```
Comando:   LIST
Risposta:  150 Opening ASCII mode data connection for directory listing.
Risposta:  226 Transfer complete.
Stato:     Contenuto cartella letto con successo
```

Sito locale: \eWon DEVELOPMENT\eXtender eWon drivers\usr\

- Compilati
- Custom Release
- Documenti vari
- eXtender eWon drivers
  - eXample TAG
  - usr
- Sorgenti
- viewON

Sito remoto: /usr

- /
  - usr

Nome file /	Dimension...	Tipo file	Ultim
..			
Config		Cartella di file	26/08
JavaApp		Cartella di file	26/08
license		Cartella di file	26/08
jvmrun	220	File	26/08

1 file e 3 cartelle. Dimensione totale: 220 byte

Nome file /	Dimension...	Tipo file
..		
Config		Cartella di file
JavaApp		Cartella di file
license		Cartella di file
jvmrun	220	File

1 file e 3 cartelle. Dimensione totale: 220 byte

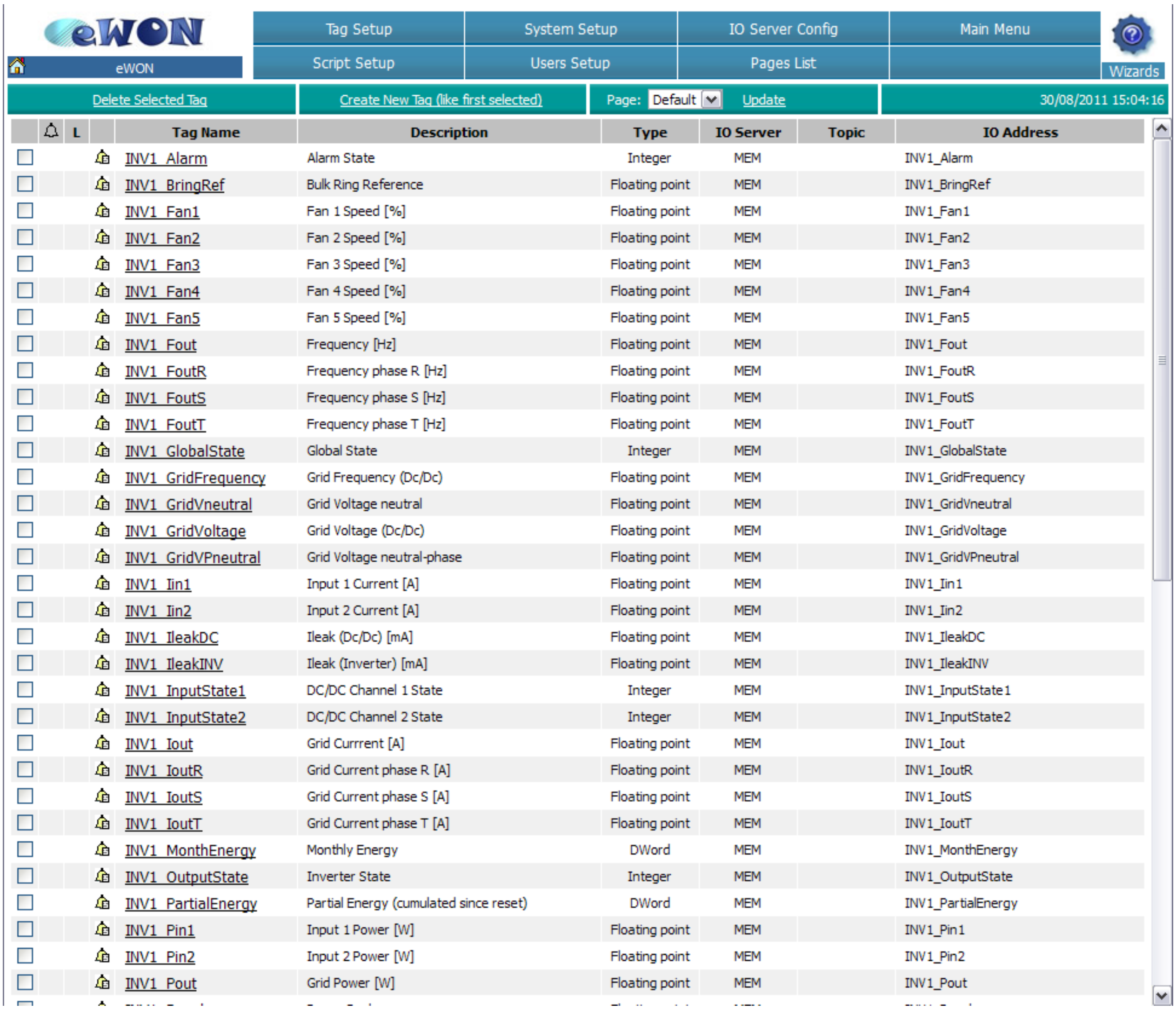
2.3. TAG Setup

For a quick configuration, for each type of protocol will be given a file **“var_lst.csv”** for the automatic generation of some sample TAG. The samples in this guide will refer to ***Aurora Power-One*** protocol.

Open the **“Aurora PowerOne”** directory in the **“eXampleTAG”** directory. Here you can find the **“var_lst.csv”** file. Upload **“var_lst.csv”** in the eWON root directory.

At the end of the transfer you got a ready to use TAG List for an **Aurora Power-One** inverter on node address 2. (see chapter 3.2 for more information on node address)

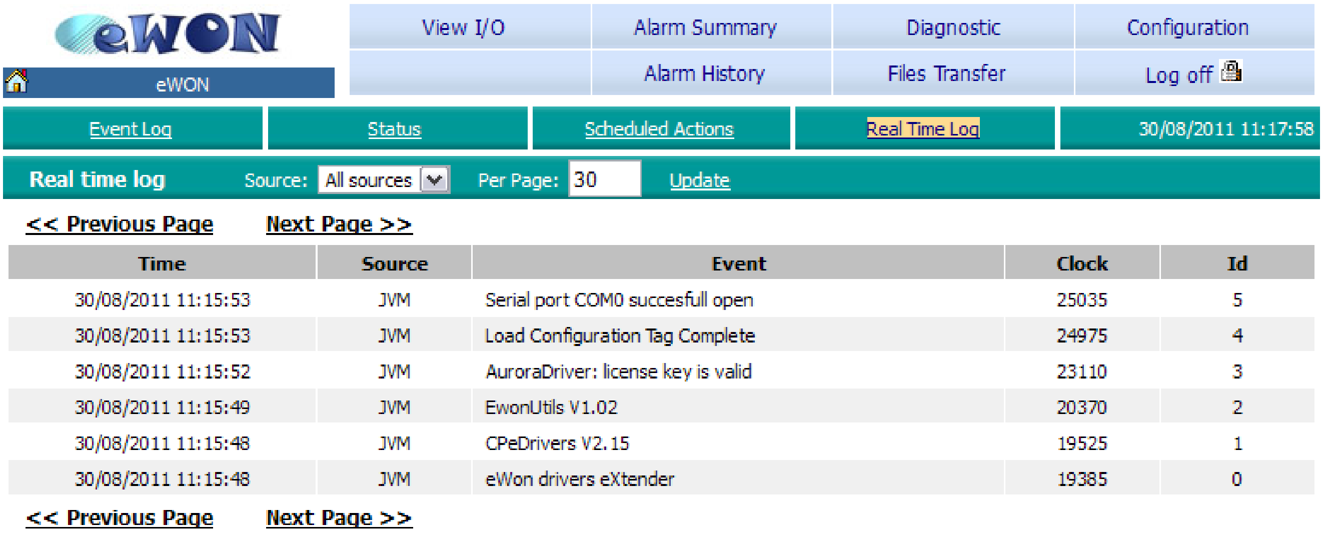
At the end of the transfer you got this TAG list:



	🔔	L	Tag Name	Description	Type	IO Server	Topic	IO Address
□			INV1_Alarm	Alarm State	Integer	MEM		INV1_Alarm
□			INV1_BringRef	Bulk Ring Reference	Floating point	MEM		INV1_BringRef
□			INV1_Fan1	Fan 1 Speed [%]	Floating point	MEM		INV1_Fan1
□			INV1_Fan2	Fan 2 Speed [%]	Floating point	MEM		INV1_Fan2
□			INV1_Fan3	Fan 3 Speed [%]	Floating point	MEM		INV1_Fan3
□			INV1_Fan4	Fan 4 Speed [%]	Floating point	MEM		INV1_Fan4
□			INV1_Fan5	Fan 5 Speed [%]	Floating point	MEM		INV1_Fan5
□			INV1_Fout	Frequency [Hz]	Floating point	MEM		INV1_Fout
□			INV1_FoutR	Frequency phase R [Hz]	Floating point	MEM		INV1_FoutR
□			INV1_FoutS	Frequency phase S [Hz]	Floating point	MEM		INV1_FoutS
□			INV1_FoutT	Frequency phase T [Hz]	Floating point	MEM		INV1_FoutT
□			INV1_GlobalState	Global State	Integer	MEM		INV1_GlobalState
□			INV1_GridFrequency	Grid Frequency (Dc/Dc)	Floating point	MEM		INV1_GridFrequency
□			INV1_GridVneutral	Grid Voltage neutral	Floating point	MEM		INV1_GridVneutral
□			INV1_GridVoltage	Grid Voltage (Dc/Dc)	Floating point	MEM		INV1_GridVoltage
□			INV1_GridVPneutral	Grid Voltage neutral-phase	Floating point	MEM		INV1_GridVPneutral
□			INV1_Iin1	Input 1 Current [A]	Floating point	MEM		INV1_Iin1
□			INV1_Iin2	Input 2 Current [A]	Floating point	MEM		INV1_Iin2
□			INV1_IleakDC	Ileak (Dc/Dc) [mA]	Floating point	MEM		INV1_IleakDC
□			INV1_IleakINV	Ileak (Inverter) [mA]	Floating point	MEM		INV1_IleakINV
□			INV1_InputState1	DC/DC Channel 1 State	Integer	MEM		INV1_InputState1
□			INV1_InputState2	DC/DC Channel 2 State	Integer	MEM		INV1_InputState2
□			INV1_Iout	Grid Currrent [A]	Floating point	MEM		INV1_Iout
□			INV1_IoutR	Grid Current phase R [A]	Floating point	MEM		INV1_IoutR
□			INV1_IoutS	Grid Current phase S [A]	Floating point	MEM		INV1_IoutS
□			INV1_IoutT	Grid Current phase T [A]	Floating point	MEM		INV1_IoutT
□			INV1_MonthEnergy	Monthly Energy	DWord	MEM		INV1_MonthEnergy
□			INV1_OutputState	Inverter State	Integer	MEM		INV1_OutputState
□			INV1_PartialEnergy	Partial Energy (cumulated since reset)	DWord	MEM		INV1_PartialEnergy
□			INV1_Pin1	Input 1 Power [W]	Floating point	MEM		INV1_Pin1
□			INV1_Pin2	Input 2 Power [W]	Floating point	MEM		INV1_Pin2
□			INV1_Pout	Grid Power [W]	Floating point	MEM		INV1_Pout

2.4. First run

If you correctly uploaded **"jvmrun"** on the **"/usr"** eWON's directory just reboot and wait for loading. Log messages are visible in the ***Real Time Log*** page of the eWON:



Time	Source	Event	Clock	Id
30/08/2011 11:15:53	JVM	Serial port COM0 succesfull open	25035	5
30/08/2011 11:15:53	JVM	Load Configuration Tag Complete	24975	4
30/08/2011 11:15:52	JVM	AuroraDriver: license key is valid	23110	3
30/08/2011 11:15:49	JVM	EwonUtils V1.02	20370	2
30/08/2011 11:15:48	JVM	CPeDrivers V2.15	19525	1
30/08/2011 11:15:48	JVM	eWon drivers eXtender	19385	0

2.5. License Key

The license file has the extension **".eKey"** and must be uploaded in the **"/usr/license"** directory of the eWON. Every license file is used to enable the protocol to which it refers. Licenses are hardware bounded and cannot be transferred from one eWON to another.

There are two kind of license:

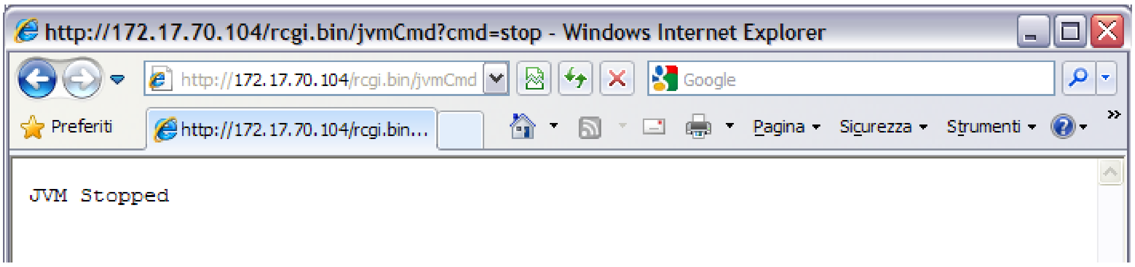
- demo license: all feature and drivers evaluable for 10 minute*
- full license: unlimited time license

*You can restart the eWON device to restart the evaluation period.

2.6. Start and Stop commands

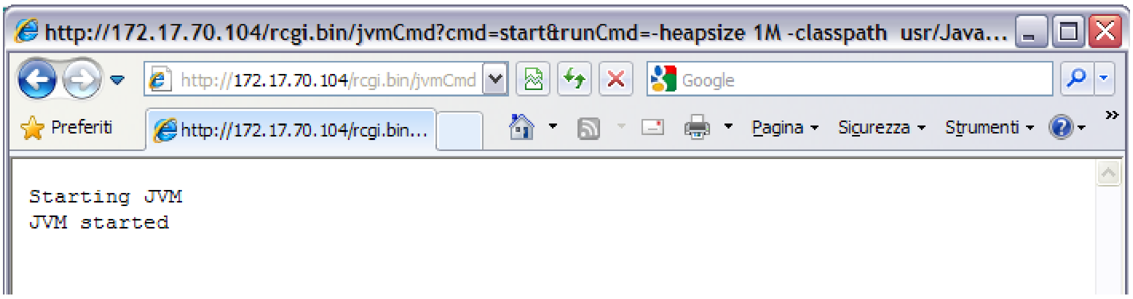
If you need to Stop and Start the *Java Virtual Machine* and thus the **eWon drivers eXtender** open the following link address with your preferred web browser:

STOP:
http://*IP-eWon*/rcgi.bin/jvmCmd?cmd=stop


http://172.17.70.104/rcgi.bin/jvmCmd?cmd=stop - Windows Internet Explorer
http://172.17.70.104/rcgi.bin/jvmCmd
Google
Preferiti
http://172.17.70.104/rcgi.bin...
Pagina
Sicurezza
Strumenti

```
JVM Stopped
```

START:
http://*IP-eWon*/rcgi.bin/jvmCmd?cmd=start&runCmd=-heapsize 250K -classpath usr/JavaApp/eXtender.jar;/usr/JavaApp/lib/CPeDrivers.jar -emain eXtender


http://172.17.70.104/rcgi.bin/jvmCmd?cmd=start&runCmd=-heapsize 1M -classpath usr/Java...
http://172.17.70.104/rcgi.bin/jvmCmd
Google
Preferiti
http://172.17.70.104/rcgi.bin...
Pagina
Sicurezza
Strumenti

```
Starting JVM
JVM started
```

3. TAG's structure

TAGs used by **eWon drivers eXtender** can be divided into three types:

Type 1: Serial ports configuration TAG
Type 2: Devices configuration TAG
Type 3: Variables TAG

For types 1 & 2 the **Description** field is used to store configuration parameters delimited by two star character (******). Every TAG must be defined on the **MEM** I/O server.
For types 1 & 2 the **Type** field must be set to **Integer**.
For types 3 the **Type** field depends on the type of data.

3.1. Serial port or TCP/IP configuration TAG (Type 1)

This TAG contains the configuration parameters of serial port or Tcp/Ip socket.

Below are the steps for proper configuration:

1. Create a new TAG with a significant name, for example: **COM0**
2. Insert in the **Description** field the configuration parameter of the protocol:
   - Parameter 1: Name of the protocol. (ex. ***AuroraPort*** for Aurora Power-One)
   - Separator: "**"
   - Parameter 2: Type of port: ***Serial*** for serial port, ***Tcp*** for Tcp/Ip socket.
   - Parameter 3: A comma separated list of serial port parameters or Tcp/Ip port parameters.

Parameters for **Serial** port:
(parameters must be inserted with the following format: Pa1=Value1;Par2=Value2;…)

Parameter	Default	Description
comm	platform dependent	The logical name of the port.
baudrate	platform dependent	The speed of the port.
bitsperchar	8	The number bits per character(7 or 8).
stopbits	1	The number of stop bits per char(1 or 2)
parity	none	The parity can be odd, even, or none.
blocking	on	If on, wait for a full buffer when reading.
autocts	on	If on, wait for the CTS line to be on before writing. IMPLIES autorts=on (even if not set - or set differently) This option is not used in half duplex mode
autorts	on	If on, turn on the RTS line when the input buffer is not full. If off, the RTS line is always on. IMPLIES autocts=on (even if not set - or set differently) This option is not used in half duplex mode
halfduplex	off	If on, turn on the half duplex mode for the serial line This is only valid if the dip switch is set to RS485/422 mode on the device. In this configuration, the device will switch the emitter on only when transmiting data. The transmiter is off for the rest of time and the device is listening to the line. autocts and autorts are not used if halfduplex=on
reuseport	off	If on, the driver will try to reuse an open port. If it fails, the it will open the port. In any case, the settings passed are applied.
keepopened	off	If on, then when the connection object is closed, the driver will remain opened. WARNING: in any case the cleanup function will close the driver. Even if

		keepopened is specified. The user must cleanly close the connection if he wants to keep it opened.

Parameters for **Tcp/Ip** socket:
(parameter must be inserted with the following format: *host:port*)

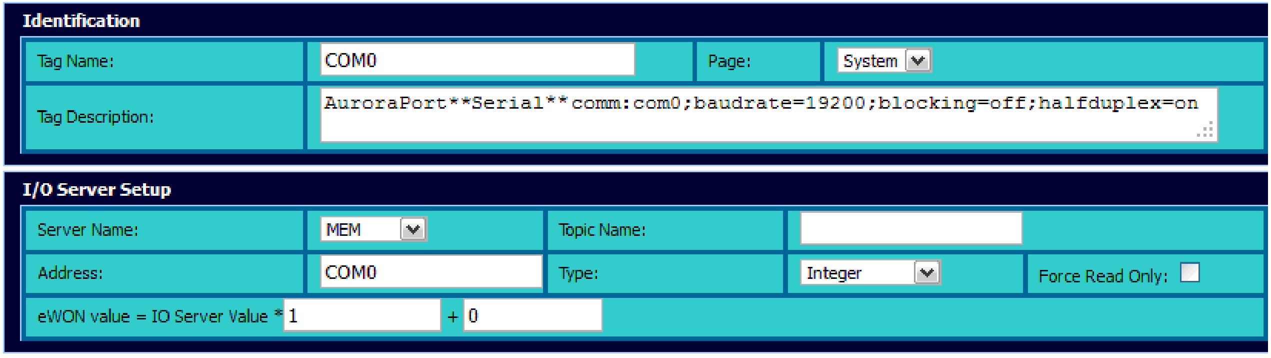
Parameter	Default Value	Description
host	-	host name or IP address
port	-	TCP/IP port nuumber

In the following example we use COM0 to communicate to Aurora Power-One inverter using the Aurora driver with baudrate 19200, 8 data bits, no parity, no blocking and half-duplex enabled.

<u>eWon TAG Name:</u> `COM0`

<u>eWon TAG Description</u>:
`AuroraPort**Serial**comm:com0;baudrate=19200;blocking=off;halfduplex=on`

<u>Configuration example:</u>



Identification

Tag Name: COM0 | Page: System

Tag Description: AuroraPort**Serial**comm:com0;baudrate=19200;blocking=off;halfduplex=on

I/O Server Setup

Server Name: MEM | Topic Name:

Address: COM0 | Type: Integer | Force Read Only: □

eWON value = IO Server Value * 1 + 0

In the following example we use TcpIp to communicate to Aurora Power-One inverter using the Aurora driver connected with host 172.17.70.111 port 2001.

<u>eWon TAG Name:</u> `COM0`

<u>eWon TAG Description</u>:
`AuroraPort**Tcp**172.17.70.111:2001`

3.2. *Device configuration TAG (Type 2)*

This kind of TAG contains the configuration parameters of the device.

Below are the steps for proper configuration:

3. Create a new TAG with a significant name, for example: **INV1**
4. Insert in the **Description** field the configuration parameter of the protocol:
   - <u>Parameter1</u>: Name of the "Serial port configuration TAG"
   - <u>Separator</u>: "**"
   - <u>Parameter 2</u>: Device's node address
   - <u>Separator</u>: "**"
   - <u>Parameter 3</u>: Time-Out (default: 10000 ms)
   - <u>Separator</u>: "**"

- Parameter 4: Device type (required for some protocols)
- Separator: “**”
- Parameter 5: Device’s unit address (required for some protocols)

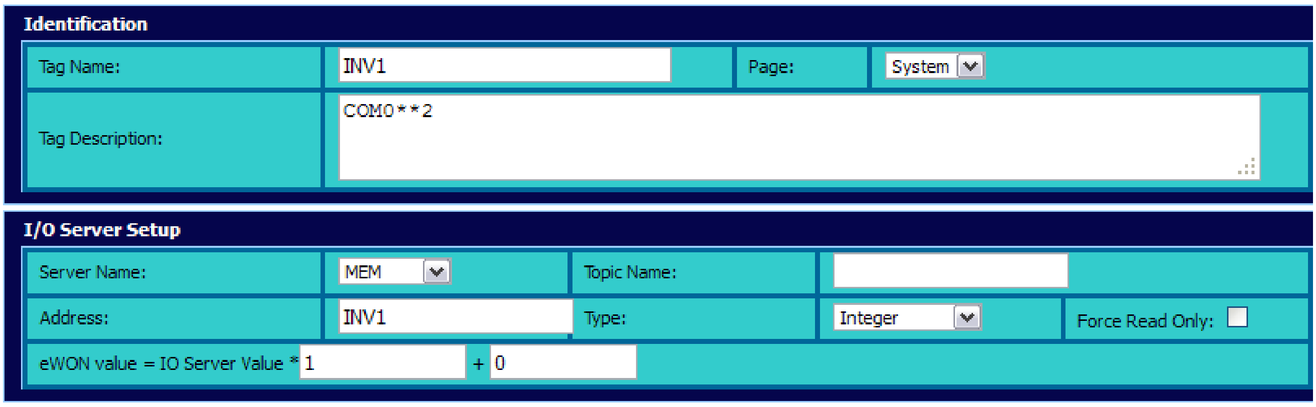
Note: Parameters may be driver-dependent.

In the following example we use COM0 to communicate to two Aurora Power-One inverters at node address 2 and 3:

eWon TAG Name: `INV1`
eWon TAG Description: `COM0**2`

eWon TAG Name: `INV2`
eWon TAG Description: `COM0**3`

Configuration example:



Identification

Tag Name:	INV1	Page:	System
Tag Description:	COM0**2		

I/O Server Setup

Server Name:	MEM	Topic Name:		
Address:	INV1	Type:	Integer	Force Read Only: ☐
eWON value = IO Server Value * 1 + 0				

3.3. *Variable TAG (Type 3)*

This kind of TAG contains the values read from the devices. The name of the TAG implies the measure to read and is composed of two references:

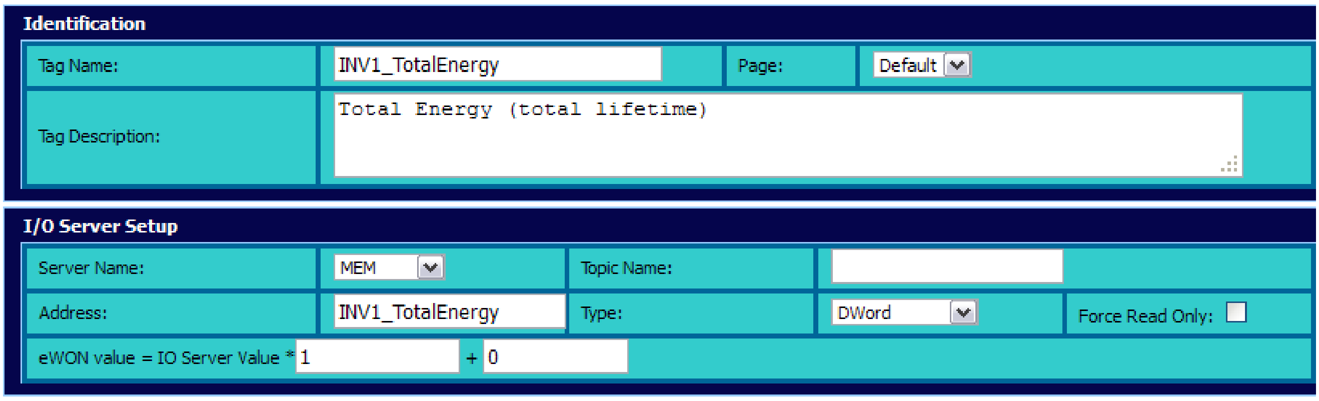
- Prefix: Name of the “Device configuration TAG”
- Separator: “_”
- Suffix: Name of the measure to read.

In the following example we define a DWord TAG used to read the TotalEnergy measure from inverter defined in the device configuration TAG INV1:

eWon TAG Name: `INV1_TotalEnergy`

Nota: The suffix is driver-dependent and can be customized.

Configuration example:



Identification

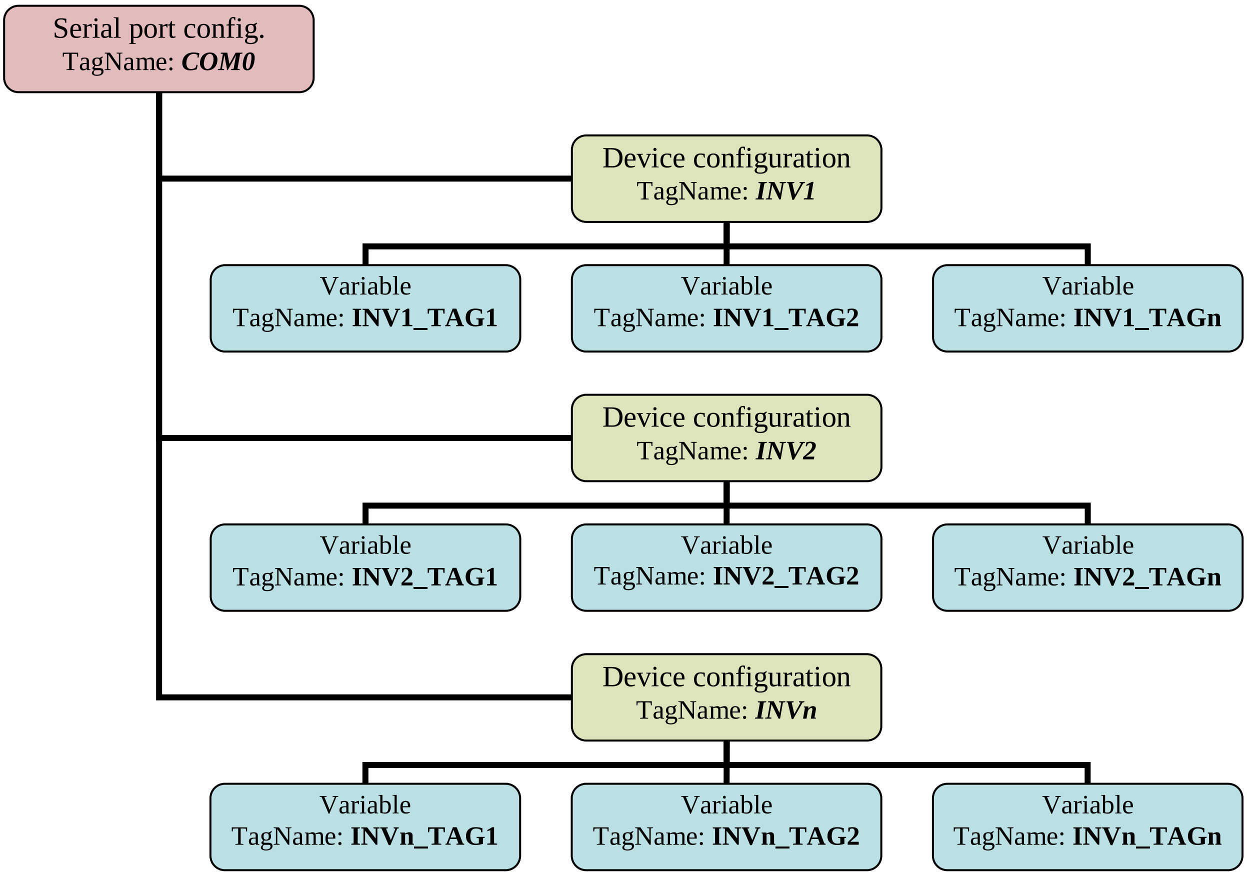
Tag Name: INV1_TotalEnergy
Page: Default
Tag Description: Total Energy (total lifetime)

I/O Server Setup

Server Name: MEM
Topic Name:
Address: INV1_TotalEnergy
Type: DWord
Force Read Only: □
eWON value = IO Server Value * 1 + 0

3.4. TAG hierarchy

Each TAG used by **eWon drivers eXtender** are related to each other according to a tree structure. The root node is a "Serial port configuration TAG". A "Serial port configuration TAG" can refer to one or mode "Device configuration TAG". A "Device configuration TAG" can refer to one or mode "Variable TAG".



eWon drivers eXtender detect as "Serial port configuration TAG" each TAG with a proper configured Description field and with a valid driver name as first parameter (es: AuroraSerialPort).

eWon drivers eXtender detect as “Device configuration TAG” each TAG with a proper configured Description field and with a valid “Serial port configuration TAG” name as first parameter (es: COM0).

eWon drivers eXtender detect as “Variable TAG” each TAG that starts with the name of one “Device configuration TAG” (es: INV1_TotalEnergy).

3.5. State, Commands and Debug

eWon drivers eXtender allow the user to send commands to the driver, read the state of the devices and read some diagnostic information.

3.5.1. Serial port configuration TAG

The value of a “Serial port configuration TAG” reports the status of the Serial port:

Status:

0	Port free
1	Port in use by **eWon drivers eXtender**

There are two diagnostic TAG for each “Serial port configuration TAG” automatically created by **eWon drivers eXtender** to analyze the number of packets sent and received.

If the “Serial port configuration TAG” name is COM0, the two diagnostic TAG will be:

- **COM0_SendPacket**: number of packets sent by **eWon drivers eXtender**
- **COM0_RecPacket**: number of valid packets received by **eWon drivers eXtender**

3.5.2. Device configuration TAG

The value of a “Device configuration TAG” reports the status of the Device:

Status:

0	Device offline
1	Device online

3.5.3. Command TAG

CPeDriverStatus: From this TAG you can read the driver’s status or write a command to modify it.

Status:

0	Driver is loading
1	Driver is running
2	Driver is stopped (the serial port is free to use)

Command:

-1	Reload the configuration and start the driver
0	Start the driver without reloading the configuration
2	Stop the driver

CPdebug: This TAG defines the log level of **eWon drivers eXtender**’s debug messages. Log messages are visible in the eWON’s ***Real Time Log*** web page.

Status:

0	Debug log disabled
1	Debug log enabled
2	Debug log enabled and serial communication log enabled

Command:

0	Disable debug log
1	Enable debug log
2	Enable debug log and serial communication log

CPeWritingEnable: This command TAG is managed only for **eWon drivers eXtender** version 4.0 and above. From this TAG you can read the global writing flag status or write a command to modify it.

Status:

0	Global writing flag is disabled (no driver will write tag values to field, even if capable)
1	Global writing flag is enabled (all capable drivers will write tag values to field)

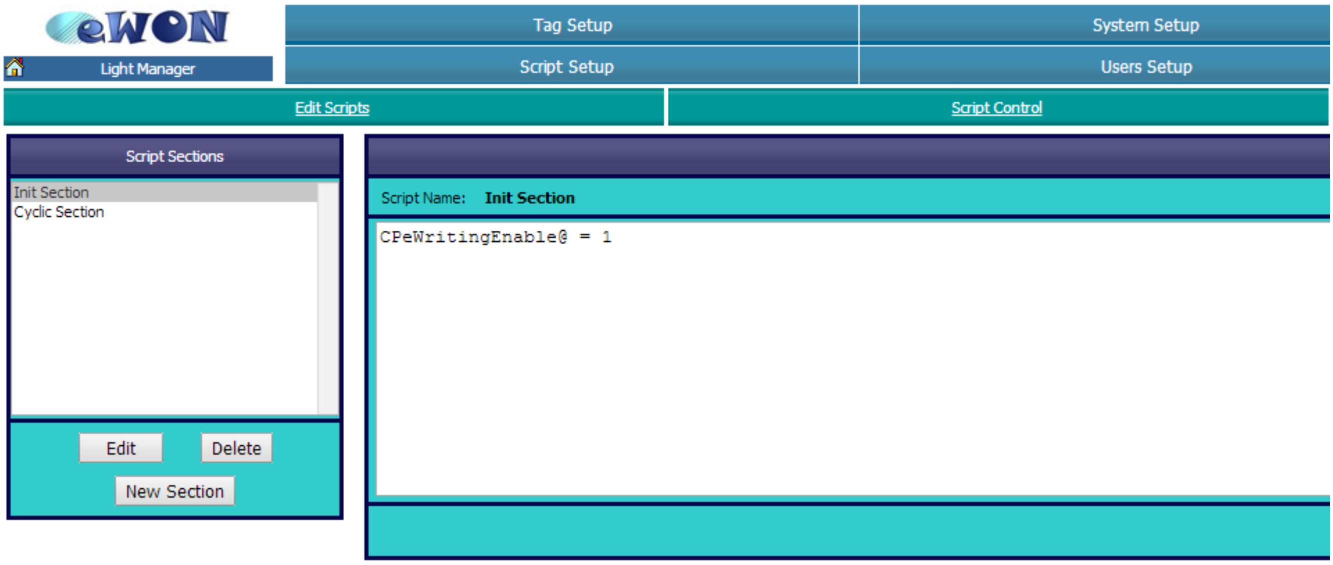
Command:

0	Disable global writing flag (no driver will write tag values to field, even if capable)
1	Enable global writing flag (all capable drivers will write tag values to field)

If you want to enable the global writing flag at eWON startup, you can add the following BASIC instruction to the Init Section in the Script Setup:

```
CPeWritingEnable@ = 1
```

Init Section example:



Script Name: **Init Section**

```
CPeWritingEnable@ = 1
```

IMPORTANT

If

d) you modify and save any tag's parameter (description, address, etc.) while **eWon drivers eXtender** is running and
e) you are using a driver that is able to write the tag value to field and
f) the global writing flag is enabled

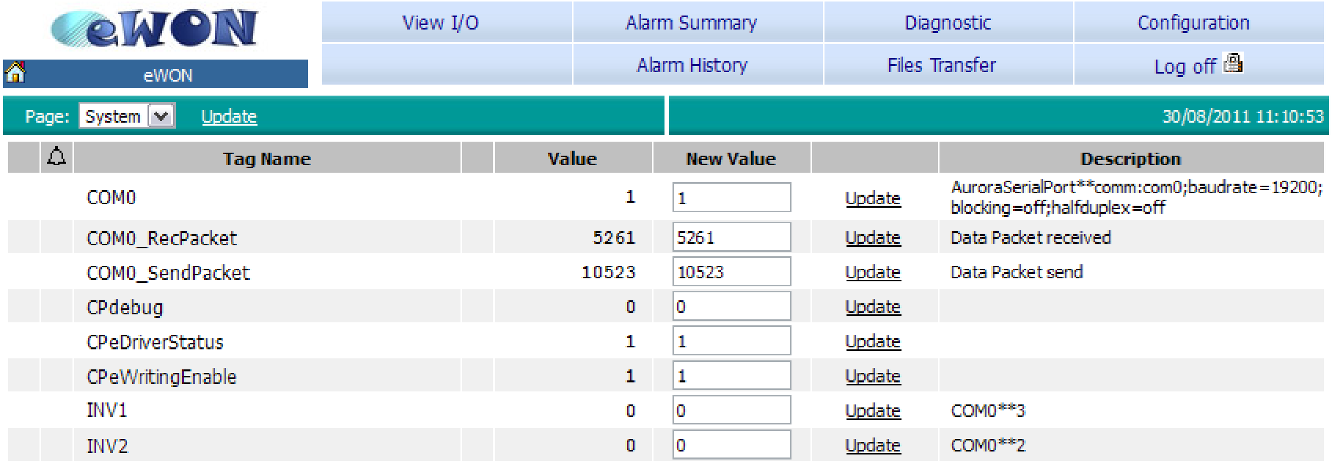
then this will cause the driver to write a "zero" value to the tag's value and so to the field.

In order to avoid this behavior you have two options:

3. Disable the global writing flag during the tag setup phase. Please refer to chapter 3.5.3 Command TAG.
4. Stop **eWon drivers eXtender** during the tag setup phase. Please refer to chapters 2.6 Start and Stop commands and 3.5.3 Command TAG.

Drivers capable of writing tag values to field are available for **eWon drivers eXtender** version 4.0 and above. Please refer to the specific driver documentation to know if it is capable of writing tag values to field.

Command tags example:



Page: System Update 30/08/2011 11:10:53

	Tag Name	Value	New Value		Description
	COM0	1	1	Update	AuroraSerialPort**comm:com0;baudrate=19200; blocking=off;halfduplex=off
	COM0_RecPacket	5261	5261	Update	Data Packet received
	COM0_SendPacket	10523	10523	Update	Data Packet send
	CPdebug	0	0	Update	
	CPeDriverStatus	1	1	Update	
	CPeWritingEnable	1	1	Update	
	INV1	0	0	Update	COM0**3
	INV2	0	0	Update	COM0**2

4. TAG Customization

eWon drivers eXtender uses a CVS configuration file to know what data put to which tag. This file is contained in the eWON's directory: "*/usr/Config*". You can modify the file to use custom "Variable TAG" suffix.

<u>Example</u>:
If we need to change TAG's name from **INV1_TotalEnergy** to **INV1_Energy**:

0 Open the driver's configuration file **"/usr/Config/PowerOne.csv"**
1 Find on the first column the suffix **TotalEnegy** and rename it to **Energy**
2 Save the file
3 Rename, using the eWON web interface, the name of the **INV1_TotalEnergy** TAG to **INV1_Energy**
4 Reload the configuration or reboot the eWON

5. Using the MODBUS gateway

All Tags read with eWon Drivers eXtender are compatible with eWON's native MODBUS gateway.