

Access Siemens PLCs and their VIPA equivalents through an existing Talk2M connection





This short guide explains how to access an Siemens PLC remotely through Talk2M and a pre-configured eWON. Applications include remote servicing of PLC-controlled equipment.



1.Objective3
2.Hardware and software requirements3
2.1 Hardware requirements
2.2 Software requirements
3.Network diagram4
4.Opening the VPN tunnel5
5.PLC software mapping configuration7
5.1 Common steps for MPI and Ethernet ISOTCP link
6.Accessing your PLC through SIMATIC STEP7®17
Revision history

1. Objective

The objective of this document is to access remotely a Siemens PLC assuming that configuration tasks have been done (*).

Accessing an existing setup remotely implies the following steps :

- 1. Opening the VPN tunnel
- 2. Mapping the PLC with your SIMATIC Step7®ⁱ software
- 3. Accessing your PLC through the Internet

(*) as per AUG-037-0-EN (Remote Access for Siemens® S7-300 & 400 PLCs, and their VIPA equivalents S300 - SPEED7.) http://wiki.ewon.biz/@api/deki/files/909/=AUG-037-0-EN-(Remote_Access_for_Siemens_S7-300%2526400_PLCs).pdf

2. Hardware and software requirements

2.1 Hardware requirements

In order to follow this guide you'll need:

- PC suitable to connect to the Internet
- Internet connection
- Configured remote setup including eWON and Siemens PLC.

2.2 Software requirements

- eCatcher VPN tunneling utility http://support.ewon.biz/softwares.htm
- Talk2M have a valid user account at disposal
- SIMATIC Step7® software. The version of the SIMATIC Step7® software must allow the use of the TCP/IP interface (version 5.3 or higher).

Note: for VIPA users, we assume the use in combination with SIMATIC Step7[®]. Achieving the same tasks in combination VIPA's software **WinPLC7** is feasible but not documented here.

3. Network diagram



- 1. From a computer running your PLC programming software you will interact with a PLC in the field just as if you were using a point-to-point connection
- 2. Using the local gateway to Internet and the eCatcher software, you will "see" the eWON as part of your local network
- 3. You will create your VPN tunnel on the Internet using your Talk2M account
- 4. This will allow you to seamlessly pass the remote firewall and safely reach the eWON using the local LAN
- 5. The eWON will allow you to access the PLC transparently, indifferently whether it is hooked using the serial or the Ethernet link
- 6. You take control over the remote PLC

4. Opening the VPN tunnel

- 1. Make sure you have installed the eCatcher application from <u>http://support.ewon.biz/softwares.htm</u>.
- 2. Start your eCatcher application, login using the credentials of the Talk2M account in which the eWON was created:

🔔 eCatch	er (3.0.2 build 7394)			
Devices				
Users	Login			
Account	Usernar Passwoi	e: pbt	•••	Use the credentials
Settings	Account	ewon_	Forgot password sales Create a Free+ account	of the Talk2M account in which the eWON was created
	✓ Remu Conr	nber me ct Automatically		
			Login	
i _{Help}				
Exit				
		Credit :	Idle	[] 😈 Talk2M

3. The application shows the eWON available for tunneling (*). At this point you only "see" the ones available on your account but you do not yet have the VPN connection required to access the PLC.

(*) Only eWON that are "online" (green icon) are "ready" for tunneling. An eWON with no icon or with red icon is not online. It can be either a GPRS/EDGE device that first needs to be waked up or a device that is simply not available for the moment.

4. Make sure your eWON is "online", select it and click *Connect* to create the VPN tunnel:

🔔 eCatcher	(3.0.0 build 7195)						
e	Active Connection						
Devices	10 m						1
*	Name	IP	Descri	ption	Use	r(s) connected	Pool
Users		No VPN connected		🚨 Vpn Co	nnection		
Æ	eWON list	eWON yet		1	VPN Tunnel :	Establishing Vpn	Tunnel
Pool	🗄 🔊 🗨 🖬 <mark>M</mark>			۲.3			
	V V		~	~	*	*	•
Account	Actio Name 🚿 Sta	tus Description	Jser(s) connect	Pool	PLC type	emote access m
Settings		eWON + IP camera		Der	eW	ON "seen" b Talk2M	
Joccarigs	1 marine	and many many		a sala	a se a		. تر

...wait a couple of seconds for Talk2M to create the route. As soon as the route is created, the connected eWON appears in the upper part of the window:

4. Opening the VPN tunnel

🔔 eCatche	er (3.0.0 build 7195	i)							
e	Active Connecti	on							7
Devices	<u>\$</u>								r
*	Name Siemens	10.8.128.22:	IP	De N + IP came	escription ra +	Us unknowr	er(s) connected nuser	Po <mark>bl</mark> Demo	÷.
Users									1
-	eWON list								₹
Pool		Disconnect	0						3
	× ×	×		*	*	×	×	v	1
Account	Actio Name	🚿 Status	Description		ser(s) connect	Pool	PLC type	emote access me	
*	Siemens	Connected eWO	N + IP camera		unknown user [Demo	AB CompactLog	LAN	19.

5. You are now connected to the eWON through the VPN tunnel.

5. PLC software mapping configuration

The objective of this step is to configure the PLC communication driver to use the remote connection instead of (or in addition to) the local connection.

- Tips -

As of firmware v12, there is a PLC Discovery feature inside the eWON. This allows the automatic discovery of PLC (ISOTCP linked to the eWON) on the network while you are connected through Talk2M. No need to set the IP of the PLC in the same range than the IP of the eWON.

For more information, please refer to AUG-070: PLC Discovery through Talk2M

If firmware version is lower than 12, please follow the procedure hereunder.

5.1 Common steps for MPI and Ethernet ISOTCP link

2. Start SIMATIC Step7® and open your existing or new PLC project. Select **Options**, **Set PG/PC Interface...**



5. PLC software mapping configuration

3. Select the TCP/IP interface that you are using on your PC and click OK. In the first example below we chose the TCP/IP(Auto) interface, but depending on your machine, you might have to select TCP/IP(Auto) →+ hardware identifier (2d example).

Set PG/PC Interface	Set PG/PC Interface
Access Path	Access Path
Access Point of the Application: S70NLINE (STEP 7) → TCP/IP(Auto) → (Standard for STEP 7)	Access Point of the Application: S7DNLINE (STEP 7)> TCP/IP(Auto) -> AMD PCNET Far (Standard for STEP 7)
Interface Parameter Assignment Used: TCP/IP(Auto) -> TCP/IP -> AMD PCNET Family PCI TCP/IP(Auto) -> TCP/IP(Auto) -> TCP/IP(Auto) -> AMD PCNET Family TCP/IP(Auto) -> AMD PCNET Family Dejete	Interface Parameter Assignment Used: TCP/IP(Auto) > AMD PCNET Family PCI TCP/IP > TAP-Win32 Adapter V8 TCP/IP > TAP-Win32 Adapter V9 TCP/IP(Auto) > AMD PCNET Family TCP/IP(Auto) > TAP-Win32 Adapter V9 Diagnostics Copy Delete
(Assigning Parameters for the IE-PG access to your NDIS CPs with TCP/IP Protocol (RFC-1006)) Interfaces Add/Remove: Sele <u>c</u> t	(Assigning Parameters for the IE-PG access to your NDIS CPs with TCP/IP Protocol (RFC-1006)) Interfaces Add/Remove: Select
Cancel Help	OK Cancel Help

- 4. Click on the Properties... button to show up the properties of the selected interface. Open the *IE-PG Access* tab and select *Do not assign IP addresses automatically*.
- 5. Click *OK* to close the properties page. Back on the *Set PG/PC Interface* window, click *OK* to set the PC/PG interface.

Properties - TCP/IP(Auto) ->	×
TCP/IP network IE-PG Access	
The IP addresses listed here are needed by STEP7 if the node is in a different subnet than the local IP address for the PG, STEP 7 creates additional temporary IP addresses on the local PG/PC for this purpose.	
C A to a R A H A A A A A A A A A A A A A A A A A	
Assign IP addresses unique to the project IP addresse Subpet mask. Network address. first IP address. [act]	
2 OK h	

6. Click **OK** to accept the changes.



Note: For MPI go ahead with the steps below. For ISOTCP Link, end of PLC mapping.

5.2 Additional steps for MPI local link only

If you use an Ethernet connection between the eWON and your PLC, then the PLC software mapping configuration ends here. You can directly establish the remote connection as explained in the chapter 8.

If you connect to the PLC using the MPI or Profibus link, then follow the steps explained hereunder:

- Download one of the following config files from our support web site (<u>http://support.ewon.biz/ewon_cfg.htm</u>).
 - eWON.cfg eWON gateway station file for Step7® if you run SIMATIC on a PC <u>that does not feature</u> WinCC.
 - eWON_WinCC.cfg eWON gateway station file for Step7® (with WinCC installed) if you run SIMATIC on a PC <u>that features</u> WinCC.

8. Open the Network Configuration *NetPro* utility of your Step7[®] project. You can access NetPro either by clicking the icon....

SIMATIC Manager - [Test_m	anual C:\Progra	m Files\Siemens\	\Step7\s7proj\	Test_man]	
🗃 File Edit Insert PLC View	Options Window He	lp.			
D 🛩 📅 🐖 👗 🖻 🖻	1 9 9 <u>9</u> <u>9</u>	1- III - III	< No Filter >	- -	188 😂 🖷 🖡
→ Test_manual → → Test_manual → →	000 Hardware	CPU 314	∺∭ ≑CP 343-1	Anness	
i⊐ 🖳 ēwon ⊕ - 💽 CPU 412-2 PCI		.		to Netpro	5

... or by selecting the menu options $Options \rightarrow Configure Network$... you obtain the NetPro network layout window shown below:



Import the eWON gateway station file you downloaded just before. Access path is *Edit* and *Import*. Browse to select either the eWON.cfg file (without WinCC) or eWON_WinCC.cfg (with WinCC) and click *OK*.

👪 NetPro - [Test_PBT (Network)	C:\Progra	m Files\\s7proj\Test_PBT]
PR Netw 1	dit Insert PLC View C	ptions Wind	dow Help
	Copy Paste	Ctrl+C Ctrl+V	
	Export	Del	
	Select Undo Selection	In	nport
	Go To Go To Connection Partner	Ctrl+E (• Export file of a station
	Object Properties Connection Partner Connection Table Master System PROFINET IO	Alt+Reti	- Import File
-	Open Object Merge Connections	Ctrl+Alt-	Cancel Help
	Merge / Unmerge Subnets		· The Assessment Annual Assessment Annual Assessment Annual Assessment Assessment Assessment Assessment Assessment

Note: the *Export file to a station* needs to be selected, though the notion of export is confusing while you will actually be importing a device configuration.

10. The eWON gateway will now be displayed in your network layout:



Note: If you have problems importing one of the config files, refer to appendix 1 of <u>Technote 29</u> explaining how to create the **eWON gateway station file for Step7**® with NetPro from scratch.

11. Click on the red square of the eWON and drag it to the MPI network of your S7 PLC to link the MPI interface of the eWON to the MPI network.



12. Open the MPI interface of the eWON by a double-click on the red square and check if the MPI address, the transmission rate and the Subnet-ID are correctly set. (Use the *Properties...* button for more details). Click *OK* twice to close the two *Properties* windows

Properties - MPI Interface MPI/DP (R0/S2.2)	×	
Address: Highest address: 31 Transmission rate: 187.5 Kbps Subnet MFIC: DElete DK Cancel Help	Properties - MPI General Network Settings Name: MEIO S7 subnet ID: 0020 - 0001 Project path: Test_manual\MPI(1) Storage location of the project: C\Program Files\Siemens\Step7\s7proj\Test_man Author: Date created: 05/19/2011 10:26:10 AM Last modified: 05/19/2011 10:26:46 AM Image: Comment	
	UKCancel	Help

13. Double-click on the green square of the eWON to configure the Ethernet Interface of the Gateway.

Network Edit Insert PLC View Options Win	low Her,	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	- second s		
	Properties - Ethernet	interface IE G	eneral (R0/S1)	×	
Ethernet(1) Industrial Ethernet	Properties - Ethernet General Parameters Set MAC address / MAC address: IP address: Subnet mask: ③ [1] Subnet: 	interface IE G use ISO protocol (use ISO protocol (used) 32.168.0.53 35.255.0.0 net Properties - Indust General Name: S7 subnet ID: Project path: Storage location of the project: Author: Date created: Last modified: Comment:	eneral (R0/S1) Gateway Do not use router C Do not use router Use router Address: 192.168.0 rial Ethernet EvVolv Gateway Ethernet C:VProgram Files/Siemens/Step7/s7proj/1 D5/19/2011 10:34:36 AM D5/19/2011 10:34:36 AM	.53 New Properties. 5 Delete	DP PA D
		ОК		Cancel Help	

As shown in the snapshot, do not check Set MAC address / use ISO protocol.

In the **IP address** field, enter the IP address of the eWON which will be used for the remote connection (in our example 192.168.0.53). For the **Subnet mask** enter the mask corresponding to the IP address you specified for the eWON (in our example 255.255.0.0).

Note: In some cases Step7 rejects Subnet masks he finds inconsistent and forces you to accept for example 255.255.255.0: you can accept while it will not harm the connection capability.

If you want, you can edit the name of the Ethernet by clicking *Properties.* Click *OK* twice to close the two Properties windows. 14. You will now add a PG/PC Station to the network layout using the path *Insert* → *Network Objects* of NetPro. Double-click on the PG/PC Station. An unconnected PG/PC station is now added in the network pane:



 Right click the PG/PC and click on *Object Properties...* and select the Interfaces tab and click *New*.

Properties -PG/PC				×
Gener	Assignment			
Name	Туре	Address	Subnet	
2 New	Properties	Generate LDB	Delete]
ОК			Cancel Help	



17. In the parameter tab, make sure the Set MAC address / use ISO protocol is NOT selected. - Set the IP address and the subnet *mask* of <u>your PC</u>. Check the Do not use router box. In the Subnet window on the bottom of the page select the network on which the eWON is connected to: in our example we named it eWON Gateway Ethernet. Click OK twice to close the two Properties windows.

Properties - Ethernet interface	×
Gener	
🔽 Set MAC address 💭 ISO protocol	
MAC address: If a subnet is selected, the next available addresses are suggested.	
IP protocol is being used	
IP address: Gateway	
Subnet mask: 255.255.0.0 C Lise router	
Address: 192.168.0.132	
Subnet:	
eWON Gateway Ethernet 1 4	
Properties	
Delete	
5 OK Cancel Help	



18. Your network layout should now look like this:

19. You will now have to assign the PG/PC interface. To do this, right click the PG/PC picture and click on *Assign PG/PC*.



20. The *Assignment* tab of the *Properties -PG/PC* wizard appears:

Properties -PG/PC					
General Interfaces Not Assigned	Assignment				
Name Ethernet port(1)	Type Industrial Ethemet	Subnet eWON Gateway	Ethernet		
Interface Parameter TCP/IP(Auto) -> TCP/IP(Auto) -> 1 TCP/IP(Auto) -> T TCP/IP(Auto) -> T TCP/IP(Auto) -> 1	Assignments in the F 394 Net Adapter lealtek RTL8139 Fa. AP-Win32 Adapter V	PG/PC: 8	 	_flm_Assign 2	
Assigned:					
Interface	Parameter assign	n Subnet	S7Online a		
<			>	S7ONLINE Access:	
3 ок			(Cancel Help	

In the *Interface Parameter Assignments in the PG/PC* select the TCP/IP interface you are using to connect to the Ethernet. In our example it is **TCP/IP(Auto)**, needs to be consistent with point 3 above. Click the **Assign** button.

Note: *in some cases, the message shown on the right may be displayed:*

You can Ignore this message and click **OK.**

Edit Obje	ct Properties	(2775:809)		×
1	The interface module type (its own paran restarted afte	e parameters (Ethernet int neter assigni er having mo	cannot be adap erface) because ment software or dified the parame	ted by this the module ł it has to be sters.	nas
			<u>D</u> etails	Help	

21. Verify that the **Assigned** Interface is the Ethernet card and click **OK**. Your network layout is now looking like this:



Note: The yellow link on top of the PG/PC shows that this object will be used to go out on the network. The orange background behind the other objects are meant to warn the user that his last changes have not been saved and compiled yet.

22. You will now have to compile and save the network layout of your project. This is achieved by following the *Network* → *Save and Compile...* path in NetPro.



- 23. Select *Compile and check everything* if you want to have NetPro reporting errors (recommended if this is your first experience). You can select *Compile changes only* if you feel confident that everything is alright. Click *OK*.
- 24. After compilation a popup will be displayed to inform you if the compilation was done with success or not. *Warning* messages are informative only and may usually be discarded. Only *error* messages reflect real network configuration problems.
- 25. The network layout of your project should now looks like this:

🎇 NetPro - [Test_manual (Network) C:\Program Files\\s7proj\Test_man]	
Network Edit Insert PLC View Options Window Help	$ \rightarrow $
	_>
1	$ \rightarrow $
	\sim
MPI(1) MPI	- 2
SIMATIC 300(1) eWON Image: Sime state	Jerrer V
PG/PC(1)	

- 26. You can close the NetPro window
- 27. End of PLC software mapping configuration

6. Accessing your PLC through SIMATIC STEP7®

- 1. Establish the Talk2M VPN tunnel towards the eWON using eCatcher
- 2. Start SIMATIC STEP7®
- Open your project and make sure you can connect with the PLC by running one of the tasks requiring communication like for example, right click on the CPU in the object tree, select *PLC* > *Set Time of Day.*

SIMATIC Mar	nager - [Test_man	ual C:\Progr	am Files\Sie	iemens\Step7\s7proj\Test_man_ONLINE]
🎒 File Edit Inse	ert PLC View Opti	ons Window He	lp	
🗅 🗃 🚟 🛲	/ X 🖻 🛍 🕍		Б- Б- Б- Б-	🖬 🕞 🔽 No Filter > 🖓 🖳 🍘 🕻
🖃 🎒 Test_manua	al 📄	S7 Program(1)		Set Time of Day
	C 300(1)		_	Path: Test_manual\SIMATIC 300(1)\CPU 314
	Cut	Ctrl+X	1	Online: Order No.: 6ES7 314-1AF10-0AB0
🕀 🖳 ewon	Сору	Ctrl+C	1	Name:
	Paste	Ctrl+V	-	Date: Time of Day:
	Delete	Del		PG/PC time: 05/19/2011 03:55:14 PM
2	PLC	· · · · · · · · · · · · · · · · · · ·	Copy RAM	μM
	Run-Time Properties		CPU Mess	Module time: 05/19/2011 03:55:13 PM
-	Rename	F2	Display Fo	Fo IM Take from PG/PC
	Object Properties	. Alt+Return	Monitor/M	More >>
-			Hardware	re the second seco
			Module Ini	Ini Apply Close Help
			Operating	ng
		(3) Set Time o	a of Day -
				in cay, ling
	ريلية كالمستعمل		San And	And the second and the second of the second

- 4. Now you can check that the actual date/time returned by the PLC internal clock. (under *Module time*). If the connection is OK, this date/time should be incrementing.
- 5. Your setup is now connected and ready to work in remote programming mode.
- 6. Once you finished your work with SIMATIC STEP7®:
 - terminate the SIMATIC Step7[®] connection through View > Offline and close the application.
 - Close the Talk2M connection (VPN tunnel) by clicking *Disconnect* in eCatcher.

				· · · · · · · · · · · · · · · · · · ·	v				
	eWON	l list							
Pool	+ 8	» ٩	Disco	nnect 💽					3
	~	1	r 🚽		*	~	*	*	
Account	Actio	Name	💉 Status	Description	lser(s)	connect	Pool	PLC type	emote access
	🛛 🍝 🛛 Si	emens	Connected	eWON + IP camera	unkno	wn user De	mo	AB Compacti on	LAN

Note: If the eWON is connected to the Internet using a GPRS/Edge modem, you may want to disconnect it to save connection costs. To close the line, you have to use the **Go offline** button which is displayed on the context menu when you right-click the eWON in the eWON list.



7. End of Accessing your PLC through SIMATIC STEP7®

Revision history		
Revision Level	Date	Description
1.0	08/09/11	First issue
1.1	15/12/16	Added "PLC Discovery" to Chapter 5

i SIMATIC® and SIMATIC Step7® are registered trademarks of Siemens.

Document build number: 10

Note concerning the warranty and the rights of ownership:

The information contained in this document is subject to modification without notice. The vendor and the authors of this manual are not liable for the errors it may contain, nor for their eventual consequences.

No liability or warranty, explicit or implicit, is made concerning quality, the accuracy and the correctness of the information contained in this document. In no case the manufacturer's responsibility could be called for direct, indirect, accidental or other damage occurring from any defect of the product or errors coming from this document.

The product names are mentioned in this manual for information purposes only. The trade marks and the product names or marks contained in this document are the property of their respective owners.

This document contains materials protected by the International Copyright Laws. All reproduction rights are reserved. No part of this handbook can be reproduced, transmitted or copied in any way without written consent from the manufacturer and/or the authors of this handbook

eWON sa, Member of ACT'L Group.