

How to connect FIMER Ethernet inverters with VSN700 Data Logger over Ethernet

How to connect supported device with VSN700-05 Data Logger over Ethernet

Basic information

VSN700-05 Data Logger is a monitoring device developed by FIMER. VSN700-05 Data Logger can be used to monitor any FIMER inverter, usually over RS485 serial communication line. With the introduction of new FIMER inverters featuring Ethernet communication interfaces the VSN700-05 can also be used for properly polling, logging and transmitting the inverter data to Aurora Vision Cloud.

Features

With VSN700 Data Logger the extensive monitoring of any FIMER inverter, both string and central type, is possible. Monitored signals can be seen from the Aurora Vision cloud portal.

Supported models

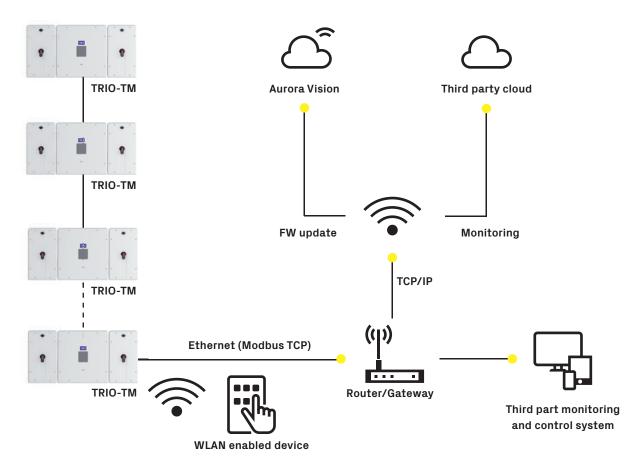
All FIMER string and central inverters are compatible with VSN700-05 Data Logger. The maximum number of inverters that are possible to connect to the logger depends on the logger model. Please refer to the logger documentation for getting further information. In the present document, we refer to the VSN700-05 Data Logger model. Theoretically it is capable to manage up to 32 devices by RS485 and similar, featuring 2 RS485 ports, it would be able to monitor up to 64 devices.

Anyway, referring to the specific case, where the VSN700-05 is supposed to be connected with the inverters over Ethernet communication bus, we recommend to connect no more than to 2 central inverters (like PVS800) or no more than 20 FIMER string inverters (like TRIO-TM inverter family) to a single VSN700-05 Data Logger.

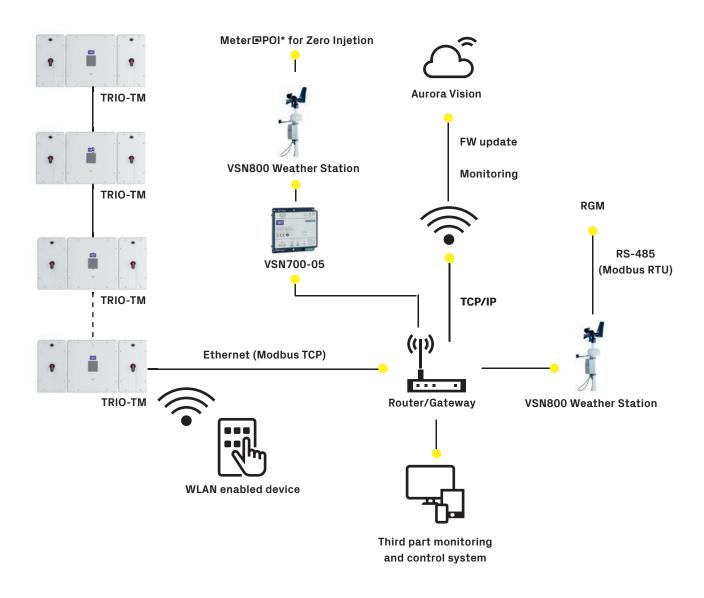
As anticipated above there are two possibilities how to connect VSN700-05 Data Logger to FIMER string inverter: Aurora Protocol or Modbus / RTU and Modbus / TCP.

Communicating with VSN700-05 over Modbus/TCP

FIMER string inverters supporting Ethernet communication interfaces, enabled daisy chain over Ethernet bus, are considered. Usually such inverters feature logging capability which enables the transmission of telemetry data to Aurora Vision without the need of installing any additional external device like the VSN700-05 Data Logger, as shown in the following picture:



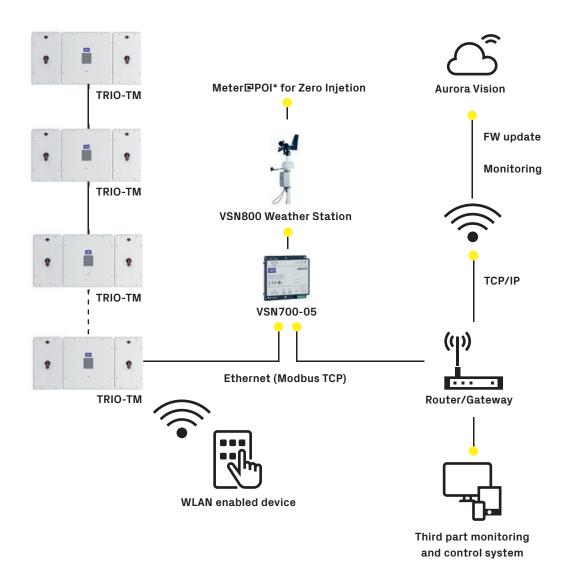
However end users may want to use the external VSN700-05 for many reasons (for example because already available on the field or for getting third party devices, like meters and environmental sensors, to be properly monitored) as shown in the below picture:



As shown above, all inverters are connected with each other over Ethernet Daisy Chain bus and the last inverter directly to the router; VSN700-05 is also connected in parallel to the router for enabling the input of telemetry data from third party devices to Aurora Vision. Modbus TCP Sunspec communication protocol is the recommended one for enabling monitoring and controlling of inverters by a third party control system that has to be connected to the same router of the inverters.

The above scheme does not require any specific setting besides the standard as indicated in both inverter and VSN700-05 Logger user manual.

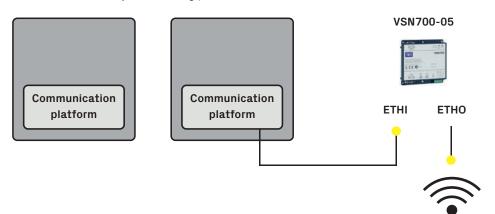
As an alternative scheme; inverters connected in daisy chain layout over Ethernet bus may also be simply connected to Internet without being directly linked to the router. Like shown by the following picture:



In this case the last Ethernet port of inverter is connected to the Ethernet port (ETH1) of VSN700-05 Data Logger that acts as main logger for the entire solar plant.

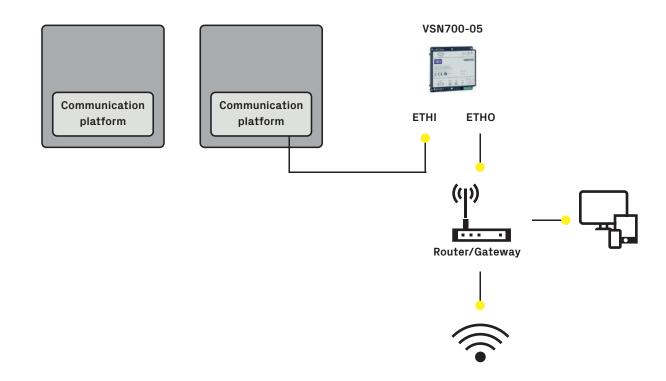
Specific VSN700-05 Data Logger setting

As anticipated above, the recommended way to connect the inverters to the VSN700-05 Data Logger is to create an Ethernet Daisy Chain with the inverters and connect this one directly to the router. Anyway, as described previously, it is also possible to get Internet passing through the VSN700-05 Data Logger. In this case, the Ethernet port of the last inverter of the daisy chain has to be connected to the ETH1 port of the VSN700-05, like shown by the following picture:



Because the ETH1 (that is usually used for configuring the VSN700-05 by PC) is now used by the Ethernet port of the inverter, we can't connect the computer to ETH1 for logger's parameters setting.

We have to connect the computer to the router where the logger is also connected.

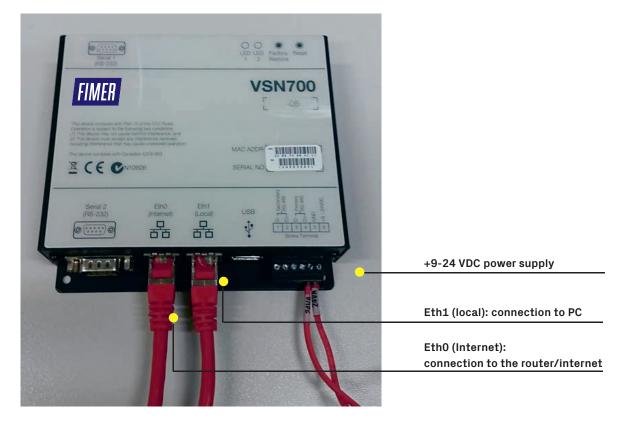


We have to be able to access the logger's internal webpage via ETH0 to setup the communication and thus we have to open port 80 from the logger's ETH0-firewall.

Below is described the procedure allowing opening port 80 from logger's ETHO-firewall and enable so the logger's setting via ETHO ports.

VSN700-05 ports settings \rightarrow Opening port 80

• Power up the Aurora Logger by connecting +9-24V power supply to the logger screw terminal pins 5 and 6



Note: Make sure that the network- and firewall-settings on your PC allow connection.

- Connect your computer to the logger's ETH1-port. The logger is acting as a DHCP server, meaning that it will give your computer an IP-address in range 172.17.17.X. Make sure that the computer you are using is in DHCP-mode, meaning that it is not using a static IP-address. Some computers are not able to use an IP-address other than in the range that is specified in the company IT policy in the computer's native LAN-port, so you might need to use a USB-to-LAN adapter like D-Link DUB-E100 to use the 172.17.17.X IP-address given by the logger.
- In your web browser go to the address logger's internal webpage by going to address http://172.17.17.1.
- You should land to a page looking like this:

URORA UNIVERSAL	i Log	gerld. 24:80:f4:80:04:f3 Fin	nware Release.
Home Network Advanced About			
Devices	1	😫 Logger	8
Primary RS-485 Modbus RTU	Find	Initialization	
Secondary R5 485 Power One Aurora Protocol		O Credentials	
Modbus TCP		🥹 Server Login	
Serial 1 RS-232		😌 Server Data In	ansfer
Serial 2 RS-232			
		Logger Registration	eboot Logger

• Go to the "Advanced" tab and click on the little pencil icon to edit the Keys and their Values:

URORA UNIVERSAL			Logger Id:	24:86:14:80:04:13	Firmware Release: 3.17.1
Iome Network Advanced Abo	ut				
Configuration Keys			i	e 🕖 —	
Key	Value	Туре	Origin Mo	odified _	
bootcount	26	string	default	_	
eth.0.dns	208.67.222.222 208.67.220.220	string	default	_	
eth.0.firewall.udp.allow	53 123	string	default		
eth.0.ipaddr	192.168.1.1	string	default		
eth.0.subnet	255.255.255.0	string	default		
eth.0.type	dhep	string	default		
eth.1.broadcast	172.17.17.255	string	default		
eth.1.firewall.tcp.allow	22 80 502 503	string	default		
eth.1.firewall.udp.allow	53 123	string	default		
eth.1.gateway	172.17.17.1	string	default		
eth.1.ipaddr	172.17.17.1	string	default		
eth.1.subnet	255.255.255.0	string	default		
eth.1.type	static	string	default		

- Find the Key eth.0.firewall.tcp.allow and add the Value 80, separated by a space if there are other values. If this Key does not exist it can be entered (must be exact), along with its Value in the two blank slots at the top.
- Then click the blue Apply icon that is to the left of the red X to apply and save the settings:

RORA UNIVERSAL			Logge	rid: 24:86:f	4:80:04:f3 (Firmware P
me Network Advanced	About					
Configuration Keys				(b)×		
(ey	Value	Туре	Origin	Modified	*	
eth.0.firewall.tcp.allow	80	string +	operator 👻			
pootcount	29	string	default			
th.0.dns	208.67.222.222 208.67.220.220	string	default			
th.0.firewall.udp.allow	53 123	string	default			
th.0.ipaddr	192.168.1.1	string	default			
sth.0.subnet	255.255.255.0	string	default		=	
th.0.type	dhep	string	default			
ath.1.broadcast	172.17.17.255	string	default			
th.1.firewall.tcp.allow	22 80 502 503	string	default			
th.1.firewall.udp.allow	53 123	string	default			
th. Lgateway	172.17.17.1	string	default			
eth. 1. ipaddr	172.17.17.1	string	default			
th. Lsubnet	255.255.255.0	string	default			
th.1.type	static	string	default			
ogger.logger1d	24:86:f4:50:04:f3	string	default			

• After saving the changes it may be necessary to reboot logger. (There is a software button for this in the Home tab).

/	Logger	2
Find	Initialization	
	Credentials	
	Server Login	
	Server Data Trai	nsfer
	Lesser Desistantian Date	
	Logger Registration Rebo	ot Logg

• After the restart routine (lasts about 1 minute), navigate to the "Network" tab and write down the IP address that is as- signed to EthO from the field "IP Address".

From now on you can access the Aurora Logger configuration UI through EthO so you can leave your PC plugged into the office LAN (or whatever LAN you are connecting the data logger's EthO to). Instead of browsing to 172.17.17.1 you would browse to the IP address that is assigned to EthO, for example 192.168.1.3

AURORA UNIVERSAL			Logger ld: 24:86:f4:80:04:f3	Firmware Release: 3.17
Home Network Advanced Abou	t			
	Interface	Ethernel (Eth0) -		
		DHEP +		
		192.168.1.3		
	Subnet Mas	k 255.255.255.0		
	Gateway	192.168.1.1		
	DNS	192.168.1.1		
		Ubdate Cancel		

Setting ethernet device network parameters

- Connect your Ethernet device to the local Switch the logger is connected with
- Please make sure that the Ethernet device is configured in order let it to
- auto-negotiate the network speed
- get an IP address to be automatically assigned by the VSN700-05 Data logger
- communicate over Modbus/TCP protocol
- get a valid Modbus Slave ID, for example "1" in this example)

VSN700-05 network settings

If you are connected via switch or router to ETH0 of the VSN700-05, log in using that IP-address which you got earlier.

Note that PC and VSN700-05 should be in same IP-area, when using switch or router. In our example IP is 192.168.1.3 for Aurora and 192.168.1.4 for PC.

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically Output the following IP address:
IP address: 192.168.1.4
Subnet mask: 255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
O Use the following DNS server addresses Preferred DNS server:
Alternate DNS server:
Validate settings upon exit Advanced

Connect an Ethernet cable to the Ethernet port of the device being configured and the VSN700-05's Eth1 (local)" port:



You can also connect your PC directly to ETH1 (local). Log in to the VSN700-05 in address http://172.17.17.1 and the Ethernet device can be connected to switch

Press the little pen in tab "Home" to change the device connection settings

iome Network Advanced About			
Devices	\oslash	Logger	2
Primary RS-485 Modbus RTU	Find	Initialization	
Secondary RS-485 Power-One Aurora Protocol		Q Credentials	
Modbus TCP		Server Login	
Serial 1 RS-232		😣 Server Data Tra	nsfer
Serial 2 RS-232			

In the "Modbus TCP" section, select the "Modbus TCP" option from the drop down menu and then add a new device by pressing "+" button.

After this select the "Device Type", set the "IP Address" assigned to the device being connected, set the "IP port" to 502, set the "Slave ID" assigned, and give a suiting "Description"

to identify the device, in case you need to change configurations later. Leave the "Extra config" blank. Click "Add".

Devices			-	×	ş
😡 Primary RS-485	Not configured	•			
Secondary RS-485	Power-One Aurora Protocol	•			×
Modbus TCP	Modbus TCP 💌			۲	×
Serial 1 RS-232	Not configured	•			
Serial 2 RS-232	Not configured	•			

Logger Registration Reboot Logger

RORA UNIVER	JAL					1	Logger1d: 24:86:f4:80:04:f3	Firmware Release
ome Network	Advanced	d About						
Devices				8	×	×		
Primary RS-	485	Modbus RTU	*		۲	×		
Secondary R	S-485	Power-One Aurora Protoco	l 👻			y		
Modbus TCP		Modbus TCP 👻			0	y		
Serial 1 RS-	232	Not configured	•					
Serial 2 RS-2	232	Not configured	*					
Add Device						×	Logger Registration	Reboot Logger
Device Type	ABB PVS8	00						
IP Address	172,17.17							
IP Port Slave Id	502 1							
Description Extra Config	PVS800te	st						
a social second sees		~						

Click the blue "Apply" icon that is to the left of the red X to apply and save the settings. 3 Restart the logger.

Ethernet device parameters should now be accessible to VSN700-05.

VSN700-05 settings for Ethernet inverter / device

If you are connected via switch or router to ETHO, log in using that IP-adress which you got earlier.

Note:

TOPAL MEAST COM

that PC and VSN700-05 should be in same IP-area , when using switch or router. In our example IP is 192.168.1.3 for Aurora and 192.168.1.4 for PC

Connect using:		General	
Intel(R) 82579LM Gigabit Network Connection		You can get IP settings assigned supports this capability. Otherw	d automatically if your network vise, you need to ask your network
		administrator for the appropriat	te IP settings.
Co	nfigure	Obtain an IP address auto	matically
This connection uses the following items:		Use the following IP addre	:55:
Image: Second Seco	^	IP address:	192.168.1.4
 File and Printer Sharing for Microsoft Networks 		Subnet mask:	255.255.255.0
Internet Protocol Version 6 (TCP/IPv6)	=	Default gateway:	
 Internet Protocol Version 4 (TCP/IPv4) Internet Protocol Version 4 (TCP/IPv4) Internet Protocol Version 4 (TCP/IPv4) 		Derduit gateway.	• • •
 Link-Layer Topology Discovery Mapper (O Driver Link-Layer Topology Discovery Responder 	-	Obtain DNS server addres	s automatically
< III	- F	- O Use the following DNS ser	ver addresses
Install Uninstall Pro	perties	Preferred DNS server:	
Description		Alternate DNS server:	
Transmission Control Protocol/Internet Protocol. The def			
area network protocol that provides communication acro diverse interconnected networks.	SS	Validate settings upon ex	it Advanced

Connect an Ethernet cable to Ethernet port of the Ethernet device and to the logger's "Eth1 (local)" port

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to the evice's Ethernet port
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d

You can also connect your PC directly to ETH1 (local). Log in to VSN700-05 in adress http://172.17.17.1 and the Ethernet inverter / device can be connected to switch.

Press the little pen in tab "Home" to change the device connection settings

ome Network Advanced About	
Devices	💋 😣 Logger 👘
Primary RS-485 Modbus RTU	Find Sinitialization
Secondary RS-485 Power-One Aurora Protocol	G Credentials
Modbus TCP	😣 Server Login
Serial 1 RS-232	Server Data Transfer
Serial 2 RS-232	
	Logger Registration Reboot Logger

In the "Modbus TCP" section, select the "Modbus TCP" option from the drop down menu and then add a new device by pressing "+". After this select the "Device Type" to be the model of the Ethernet device being connected (for example "ABB PVS800"), set the "IP Address" same as the Ethernet device's address,

set the "IP port" to 502, set the "Slave ID" to same as the Ethernet device setting (for example "PVS800" parameter 52.01), and give a suiting "Description"

to identify the device, in case you need to change configurations later. Leave the "Extra config" blank.

Click "Add"			
😣 Primary RS-485	Not configured		
Secondary RS-485	Power-One Aurora Protocol 💌	بتحر	
Modbus TCP	Modbus TCP	🗳 💿 -	
Serial 1 RS-232	Not configured		
Serial 2 RS-232	Not configured		
Click on ADD button			Logger Registration Reboot Logger

Select the "Modbus TCP

JRORA UNIVER	SAL				L	.ogger1d: 24:86:f4:80:04:f3	Firmware Release:
ome Network	Advance	d About					
Devices				8	p		
Primary RS-	485	Modbus RTU	*	۲	y		
Secondary R	\$-485	Power-One Aurora Protoc	ol 👻		*		
Modbus TCP		Modbus TCP 👻		0	4		
Serial 1 RS-	232	Not configured	*				
Serial 2 RS-	232	Not configured	*				
Add Device					×	Logger Registration	Reboot Logger
Device Type	ABB PVSB	00					
IP Address	172,17.17						
IP Port	502 1						
Slave Id Description	PVS800tes	4	ADD button				
Extra Config	1	-					

Click the blue "Apply" icon that is to the left of the red X to apply and save the settings. Restart the logger.

Ethernet device parameters should now be accessible to VSN700-05 Data Logger UI.