

TL-X/XH Series Export Limitation Introduction



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1、 Inverter Models

This series of inverters can achieve Export Limitation by connecting a meter or CT. The following models belong to this series of inverters:

MIN 2500TL-XH、MIN 3000TL-XH、MIN 3600TL-XH、MIN 4200TL-XH、MIN 4600TL-XH、MIN 5000TL-XH、MIN 6000TL-XH.

Make sure that the inverter is the latest firmware version and is a single-phase inverter model with RS485 port.

2、 Dynamometer

The model of the meter is Eastron SDM230-Modbus and the model of CT is TOP 90-

 $S10\,/\,SP4~$ (LEM) .The CT aperture is 10mm and the output cable length is 5m.

Notice: In the case of using a smart meter, when the communication of meter is disconnected from the inverter, the inverter will limit the power according to the "Default power after ExportLimit failure" that you set. CT has not yet activated this function.

3、 Communication Port Definition

Note: Smart meters, CTs and inverters can transmit data and implement to related operations through the ExportLimit communication port. Please carefully confirm the definition of each port of the inverter, meter RS485 and CT.

Number	Definition	Function
1	Enable-	DDC Enchlo
2	Enable+	BDC Enable
3	RS485A+	External RS485
4	RS485B-	communication port
5	ExportLimit-A	ExportLimit
6	ExportLimit-B	communication port
7	BAT-B	BDC communication
8	BAT-A	port

3.1. Definition of Inverter SYS COM RS485 Port

Table.1. Definition of inverter SYS COM RS485 port



Figure.1. SYS COM RS485 port

As shown in the above table, the inverter ExportLimit communication port is SYS COM 5, 6 pin, you can communicate with the meter or CT through the No.5 and No.6 communication port.

Number	Definition	Function
5	RS485A	External RS485
6	RS485B	communication port
7	GND	
8	₋ ŗ┓ 1+	
9	СОМ	
10	_ _ ¬ 2+	

3.2. Definition of Meter RS485 Port



Table.2. Definition of Meter RS485 port

Figure.2. SYS COM RS485 port

As shown in the above table, the RS485 external communication port is 5 or 6 pins. You can communicate with the inverter through the No.5 and No.6 communication port of the meter.

3.3. Indication of CT Connection

CT has a black wire and a black & white wire. As shown below: Black & White is positive and Black is negative. The arrow on the CT points from the grid side to the load. You can communicate by connecting the CT to the inverter SYS COM 5, 6 pin.



Figure.3. CT Structure

4、 Meter / CT Connection

4.1. Indication of Meter Connection

The meter must be installed after the load, close to the grid side, the direction of electricity consumption is positive.

Please install the meter between the grid and the load. Follow the diagram to connect the No. 5 Pin (RS485A) of meter to the COM5 (ExportLimit-A) of inverter; connect the No. 6 Pin (RS485B) of meter to the COM6 (ExportLimit-B) of inverter. The meter input terminal is connected to the grid end, and the meter output end is connected to the load side. The specific meter connection diagram is as follows:



Figure.4. Indication of Meter Connection

4.2. Indication of Meter Connection

The CT must be installed after the load, close to the grid side, the direction of electricity consumption is positive.

Please follow the diagram to connect the CT black & white wire to the inverter COM 5: ExportLimit-A; connect the CT black wire to the inverter COM 6: ExportLimit-B. The CT should be installed on the L line, and its arrow points from the grid side to the load. The wiring diagram of the CT and inverter RS485 port communication is shown below:



Figure.5. Indication of CT Connection

5、Setting

The following four methods can be used to set the ExportLimit power. This article will use the meter as an example to introduce the four settings of ExportLimit.

5.1. Setting through OLED

	The inverter can support n	nultiple touch modes: single touch, two				
	consecutive touches, three consecutive touches, and long press 5S.					
	Different touch methods ha	ave different functions. Advanced setup				
OLED	password: 123					
Touch Button	Touch Methods	Definition				
instructions	Single Touch	Move, page turning or number add 1				
	two consecutive touches	Enter setting mode or confirm the setting				
	Three consecutive touches	Return to the previous page				
	Long press 5S	Data zeroing				

Table.3. OLED Touch Button instructions

The MIN series inverters have a stand-alone ExportLimit function. You can do this with a meter or CT. First, touch the "Parameter Settings" interface with a single touch, select "Advanced Settings" and enter the password. Touch twice continuously to enter "Export Limit", select "On" and then select "Meter", then set the ExportLimit power to complete the setting. You can set it successfully by touching it twice continuously. The schematic diagram of the OLED ExportLimit function flow is as follows:



Figure.6. Indication of CT Connection

Notice: The OLED cannot be used to set the "Default power after ExportLimit failure", if this setting need to be set, please use other setting methods shows in this article.

5.2. Setting through ShineServer

If the inverter is monitored online via the Growatt monitoring system, you can enable ExportLimit via ShineServer. First login to ShineServer, click "Plant" and go to the "Device List" interface, select to enter "Min", you can see the inverter list. Select the inverter and click the setting icon to enter the setting interface.

Growatt #	xhtest • < <power list<="" station="" th=""><th></th><th><u>Manage.plant</u> \ominus Welcome: /*월귀2만—郞(Normal user) 😝</th></power>		<u>Manage.plant</u> \ominus Welcome: /*월귀2만—郞(Normal user) 😝
Device		11 🔽 🛢 🕸	
Current location: Device>Ph	otovoltaic equipment>datalog	Dashboard Energy Device Log Setting	
Photovoltaic equipment			
	0 6000 current power(kWh) rated power(kWh)	24 62.2 267.4 Torary today(XMh) Monthly(XMh) Total energy(XMh)	O O O Income today(¥) Income month(¥) Income toda(¥)
datalog Inverter	MIN		
			device serial number or alias :
TL-XH cy02 Z			(=)
(1)	Device serial number : RSD0904019 connect statu	s : connection last login/update time : 2019-07-06 15:43:53	Datalog setting
1	user name : 产品开发一部 Plant name :	tuhtest device type : ShineGPRS-X	
	IP & Port : /192.168.15.1:7864 data update i	nterval : 0.1 firmware version : 1.3.0.8	Delete
			total 1 Articla provinces 1 part To first 1 page 144
			and the second buckless and second to make a build have
Growatt #	xhtest 🔹 < <power list<="" station="" td=""><td></td><td>Manage.plant 📀 Welcome: 严品开注—据(Normal user) 🧔</td></power>		Manage.plant 📀 Welcome: 严品开注—据(Normal user) 🧔
Device		11 🔽 🛢 🎕	
		Dashboard Energy Device Log Setting	
Current location: Device>Ph	otovoltaic equipment>MIN		
Photovoltaic equipment			
	0 6000 current power(kWh) rated power(kWh)	2.4 62.2 267.4 Energy today(KWh) Monthly(KWh) Total energy(KWh)	O O O Income today(V) Income month(V) Income total(V)
datalog Inverter	MIN		
			device serial number or alias :
CHENGYONG2/			
(1)	Device serial number : connect status : mai	Hunction last login/update time : 2019-07-06 rated power(W) : 6000 15:45:01	B≣ History Data
	user name : 产品开发一部 Plant name : tbhtes	t datalog : RSD0904019 current power(W) : 0	
	Today energy(kWh) : 2.4 Total energy(kWh) :	267.A	(≑) Setting
			total 1 Article previous 1 next To first 1 page yes

Figure.7. Indication of setting the inverter on the ShineServer

Select "Set Export Limit", select "Enable meter 1", fill in the limit power percentage and the password then click save to set export limit successfully.

Notice: "Set Export Limit" can choose "Forbid", "Enable meter 1", "Enable meter 2" and "Enable CT". The MIN series are not support to use "Enable meter 2".

Setting			
) Set active power rate		6	% Not memory
○ Set reactive power rate	1	PF fixed 1 v	Not memory 🛛 🔻
🔾 Set Time		2019-07-06 16:29:4	
🔾 Connect Vac High		253.0	
◯ Connect Vac Low		195.5	
○ Connect Fac High		50.05	
O Connect Fac Low		47.55	
Cont Contractilization		Enable meter 1 🔍	Percent
 Set ExportLimit 		50	Percent
O Default power after anti-backflo failure	W	0.0	96
O Dry contact function		Off 🔻	
O Dry contact power		50.0	96
O Dry contact off power		40.0	96
~ -		Not choose 👻	

Figure.8. Indication of setting Export Limit on the ShineServer

If the dynamometer you are using is a smart meter and you need to set the "Default power after ExportLimit failure", you can do the following on ShineServer:

After entering the setting interface, fill in the "Default power after ExportLimit failure". After entering the password, click Save to display the success.

) Set active power rate		6	% Not memory V
) Set reactive power rate	1	PF fixed 1 v	Not memory 🛛 🔻
) Set Time		2019-07-06 16:29:4	
🔵 Connect Vac High		253.0	
🔵 Connect Vac Low		195.5	
⊖ Connect Fac High		50.05	
Connect Fac Low		47.55	
) Set ExportLimit		Enable meter 1 💌	Percent 💌
Default power after anti-backfi failure	low	20	96
) Dry contact function		(Off 🔹	
Dry contact power		50.0	96
Dry contact off power		40.0	96
Dynamometer		Not choose 💌	

Figure.9. Indication of setting Default power after ExportLimit failure on the ShineServer

5.3. Setting through ShinePhone

If the inverter is monitored online via the Growatt monitoring system, you can enable Export Limit via the ShinePhone. First login to the shinephone, click on "Plant" to see the inverter list. Select the inverter, enter the details page and click the "Control" to enter the setting interface.



Figure.10. Indication of finding the setting interface on ShinePhone

Select "Set Export Limit", input the password, select "Enable meter 1", fill in the limit power percentage and then press save to set export limit successfully.



Figure.11. Indication of finding the setting interface on ShinePhone

If you use smart meter as dynamometer and want to set the "Default power after ExportLimit failure". You can operating on ShinePhone like following: Select "Default power after ExportLimit failure", input the password then input the power rate, press "Yes"



Figure.12. Indication of setting "Default power after ExportLimit failure"

Notice: "Set Export Limit" can choose "Forbid", "Enable meter 1", "Enable meter 2" and "Enable CT". The MIN series are not support to use "Enable meter 2".

5.4. Setting through ShineBus

To set up the inverter with ShineBus, the inverter need to connect to the host computer with the communication line, connect the RS485 port of the communication line to the SYS COM 3, 4 pin of the inverter, and connect the USB port of the communication line to the host computer.

First, use ShineBus to read the inverter information to ensure the inverter and the host computer communicate successfully. Click "Configuration" to select "ExportLimit enable" in the "ExportLimit setting", write "1" and click "Set" to display "Set successful". That means the meter 1 ExportLimit function has been successfully set.

nput Info	Port: COM14	•	Baudrate: 9600	•	Address 1		Period: 1000		Ex	port L	an Help
Device Info BDC Info	System Info FM Ver: FM Ver: SN: Node:	ALI: 0 (ALas-03 ZAbs-0030 CHENGYONG2 SOABOODOOTOOF	05 30) 0FU01M003C	State Info Status: E Today: Pout Active: PF:	OnGrid 7.8kWh 4887.3W 1	Count down: E Total: Pout Apparent: Power:	60 53.3km 4857VA -3828	AC Info AC Volt (V) AC Curr (A) AC Power (VA) AC Freq (Hz)	224.7 21.7 4857 49.96		
BDC Time Set	Protocol Ver: Info	V1.49		Error:	null	Farn:	null	Di lufa			
Configuration								PV Volt (V)	PV1 257.6	PV2 257.9	,
Parameter								rv turr (A)	3.5	3.3	
FW Update								Inner Info	+BUS 390. 7	-BUS 0	BUS 390. 7
Settings								Temp(°C)	INV 67.3	Inner1 57.6	
Modbus Test								ISO (k12): Derate Mode:	65530 0		
art Diagnosis								PV Mode:	Pa	allel	

Figure.13. Indication of find "Configuration" in ShineBus

Min shinebus	And the second		-				
Input Info	Port: COM7 🗸	Baudrate: 9600 👻	Address 1	Period: 1000	Export	Lan H	Help
Device Info							
BDC Info	Configuration:	01.0n/0ff Inv(00)	•				
BDC Time Set	Value:	02. Set ActivPower Po 03. Set ReactivPower 04. Ongrid settings 05 BDC settings	er (03)				
Configuration	Remarks:	06. ExportLimit sett: 07. DryContact settin 08. Limit Device (533)	ings E ngs)				
Parameter		10. Freq settings 11. Enable Neutral (2: 12 Enable SPI(01)	Enable (2 32)				
FW Update	Step:	13. Enable LVFRT(01) 14. Enable 6kW(01) 15. SaftvFunc Enable	(01) -				
Settings		S	et				
Modbus Test							
Smart Diagnosis							
AutoTest							

Figure.14. Indication of find "ExportLimit setting" in ShineBus

Nin shinebus	And the second	1. 4. 1.	-		
Input Info	Port: COM7 🗸	Baudrate: 9600 👻	Address 1	Period: 1000	Export Lan Help
Device Info					
BDC Info	Configuration:	01.Export limit enable 01.Export limit enable	e (122) 🔻		
BDC Time Set	Value:	02.Anti-backflow Meter 03.Anti-backflow failu upper	rPower Li nre defau Inable		
Configuration	Remarks:	E Read			
Parameter					
FW Update	Step:				
Settings		Set			
Modbus Test					
Smart Diagnosis					
AutoTest					

Figure.15. Indication of find "ExportLimit enable" in ShineBus

You can choose "ExportLimit power rate" at "ExportLimit setting" at "Configuration" page, write in the power rate which is between 0 and 100. Click "set", if it shows "Set successful", it means the setting is already successful.

Nin shinebus		Real Property lies			
Input Info	Port: COM7 ←	Baudrate: 9600 🗸 🗸	Address 1	Period: 1000	Export Lan Help
Device Info					
BDC Info	Configuration:	01.Export limit ena	ble(122) -		
BDC Time Set	Value:	02. Anti-backflow Me 03. Anti-backflow fa upper	ilure defau inable		
Configuration	Remarks:	- Read			
Parameter					
FW Update	Step:				
Settings		S	et		
Modbus Test					
Smart Diagnosis					
AutoTest					

Figure.16. Indication of set "ExportLimit Power rate" in ShineBus

If your dynamometer is meter, you can set "Default power after ExportLimit failure" on ShineBus:

First, in "Configuration" page, select "ExportLimit setting", then select "Default power after ExportLimit failure"; file in the percentage which range is from 0 to 100, after that, click "set", when it shows "Set successful" means the setting is enable now.

Nin shinebus		Real Providence and			1-	- • ×
Input Info	Port: COM7 -	Baudrate: 9600 👻	Address 1	Period: 1000	Export	Lan Help
Device Info						
BDC Info	Configuration:	01.Export limit enabl 01.Export limit enabl	le(122) ▼ le(122)			
BDC Time Set	Value:	02.Anti-backflow Mete 03.Anti-backflow fai upper	erPower Li lure defau Inable			
Configuration	Remarks .	Read				
Parameter						
FW Update	Step:					
Settings		Set				
Modbus Test						
Smart Diagnosis						
AutoTest						

Figure.17. Indication of set "Default power after ExportLimit failure" in ShineBus

6、ExportLimit Real Test

The ExportLimit power rate is to set the allowed power to the grid. After the meter or CT is enabled, the ExportLimit power rate of 10%, 30%, 50%, 80%, and 100% are respectively set, and the power allowed to the grid is recorded by remote monitoring. As shown in the figure below, it can be observed that the power allowed to the grid during the operation of the inverter is basically consistent with the setting power.



Figure.18.The real test of ExportLimit