



# KNX Energy Actuator User Manual

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## **Update History**

The form below contains the information of every update. The latest version contains all the updates of all former versions.

No.	Version	Update Information	Date
1	V1.0.0	Initial release	Oct. 18, 2019





## 1 Introduction

This user manual is aimed at explaining the configuration of KNX Energy Actuator. The following tools might be included:

- KNX Energy Actuator
- > A computer with ETS5 software
- KNX USB interface (Model: M/USB.1)
- > KNX power supply and auxiliary power supply
- KNX project files
- Dedicated KNX cable(s)

#### Notice:

Please refer to the datasheet attached to the product for the information of function, wiring, installation, etc.



## 1.1 Import Data

#### 1.1.1 Import Database into ETS (.knxprod)

**1. Import Catalogs:** click "Catalogs" → "Import…" in the main page of ETS5 and select local database files with the suffix of .knxprod, as shown in Figure 1-1.

<b>⊞</b> ETS5™						×
ETS						0
Overview Bu	Catalogs	Settings			KNX	*
📩 Import 🚺 Export	. 🛆 🍚 Download	I → HDL → Pr	oducts	Sear	rch	Q
📌 Favorites 🔹	See Manufacture	r Name Order	Mediu Application	Version		
My Products	HDL	YEE Panel 3R M/P3	TP YEE Panel 3Rocker Con	1.0	Catalog Application	
Recent Products	HDL	YEE Panel 2R M/P2	TP YEE Panel 2Rocker Con	1.0		
Manufacturers •	HDL	Energy 3fold M/EA	TP Energy 3fold Actuator(	1.0		
Products						
Houces						
	¢			>		
			ETS Version ETS	5.6.4 (Build 842)	License Demo Apps 0 activ	/e!

Figure 1-1 Import catalogs



2. Create Projects: as shown in Figure 1-2, in "Your Projects" tab page of "Overview" page, click "+" to create projects. After editing project name, please keep other setting items by default.

ETS5™ ETS					
Overview	Bus	Catalogs	Settings		KNX
Your Projects	Project Arc	hive		KNX News	New KNX Products
+ 🗶 📩 Create New Pi	roject	Search	Q	Modern, Massive, Moscow – The 15th KNX National Group Conference kicked off with many surprises 2019/10/7	True Presence® ( ) Multisensor KNX Steinel GmbH (Germany)
Name HDL Backbone IP Topology ✓ Create Line 1.1	•			This year, the 15th KNX National Group Conference welcomed delegates from 20 countries. Hosting city was Moscow – Not known by many, but appreciated by all. The first day's agenda had various surprises for the delegates regarding the future of	
<ul> <li>✓ Create Line 1.1</li> <li>TP</li> <li>✓</li> <li>Group Address Style</li> <li>Free</li> <li>Two Level</li> <li>Three Level</li> <li>Create Project <u>Cancel</u></li> </ul>				NVX Association, Tools, and upcoming events. The day after followed with additional presentations and discussion on Social Media activites, best practices and other open subject were discussed between KNX and its National Groups Although both days required the full attention of the delegates, all delegates are anticipating the next day with high excitement.	7 senses for KNX. Welcome to the new era in building sensor technology! True Presence® provides absolutely reliable information on human presence and absence. The revolutionary technology is based on ultra-sensitive high-
				NETx Multi Protocol Server	Certified KNX Products See a list of all certified KNX products here.
				ETS Version ETS 5.6.4 (Build a	842) 1 License Demo Apps 0 active

Figure 1-2 Create projects



#### 3. Add Devices to Projects

① After creating a project, the project page will show up by default. Click "Buildings" and select "Topology", as shown in Figure 1-3.

ETS Edit Workplace	Commissioning Diagr	ostics Extras W	/indow					^ <b>(</b> )
🛛 👩 Close Project 🧳 U	Undo 🐴 Redo 🚔	Reports	Workplace 🔻 📗	Catalogs	Diagno	ostics		
Buildings 🔻					▲ □	rop	erties	>
Buildings	と Download   👻 (	🚺 Info 🔹 <u> </u> Res	et 🔹 Search	ı	j.			
Coup Addresses	Room	Description	Application Progra	am	F	dr Settings	Com	Infor
Topology								
📃 Project Root								
Devices								
🚔 Reports								
Catalog								
Diagnostics						Selec	t an eleme letails bere	nt to
						500 0	etano nere	
						P Find	and Replace	
						Work	spaces	
						O Todo	Items	
						Pend	ing Operatio	ons
Dev	vices Parameter	Building Date				Vinda Vinda	History	
<no 1.<="" a="" interface="" sel="" td=""><td>1 New line</td><td>Buildings</td><td></td><td></td><td></td><td>Last us</td><th>ed workspace</th><td></td></no>	1 New line	Buildings				Last us	ed workspace	

Figure 1-3 Select topology



 Figure 1-4 shows "Topology" page. Click the arrow beside "Add Areas" and select "Devices". The catalog page will show up below.

		x
ETS Edit Workplace Commissioning Diagnostics Extras Window	^	0
👔 Close Project 🍫 Undo 📣 Redo 🚔 Reports 📑 Workplace 🔻 🎚 Catalogs 📰 Diagnostic	is	
Topology 🔹 🔨 🗖 🗙	Properties	>
🕂 Add Areas 🔻 🗶 Delete 🛬 Download 💌 🕦 Info 👻 💁 Reset 🔹 🔹 Search 🔎		
Topology Areas Description Application Program Adr Pro	Settings Com Infor	
Dynamic 📙 Lines	Backbone Name	^
I New ar Devices	Backbone area	
	Description	
	Status Unknown - Backbone Medium	
Areas / Lines / Devices / Parameter /	IP •	
Catalog V	WAN (< 2s)	
Limport 🖾 Export 🛆 🖓 Download 💷 > Manufacture Search 🔎	Multicast Address	
★ Favorites         Set         Manufacturer         Name         Order         Mediu         Application         Version	224.0.23.12	
My Products MIDL	Security	
Kecent Pro     HDL YEE Panel 2R M/P2 TP YEE Panel 2Rocker Con 1.0	Automatic 🔹	
HDL Energy 3fold M/EA TP Energy 3fold Actuator( 1.0	Bus Connection	~
	Find and Replace	
	Workspaces	
	🕗 Todo Items	
	Pending Operations	
Items: 1 in Lines   O.0 Backbone line  Add	🖍 Undo History	
HDL USB Interface 🔺 1.1 New line Manufacturers	Last used workspace CAPS	<b>.</b>

Figure 1-4 Open catalog page



③ As shown in Figure 1-5, after selecting "HDL" in "Manufactures" column, select devices to be added to the project on the right. And drag devices to the above area (Method 1) or click "Add" button to add devices after clicking the location needed to add projects below (Method 2).



Figure 1-5 Add devices to projects



#### 1.1.2 Import Project (.knxproj)

As shown in Figure 1-6. After opening ETS5, click "Import project" of "Your Project" page of "Overview" page and import obtained KNX project files with the suffix of .knxproj. After the projects are imported successfully, added/created projects will be listed below. Double click to edit.

<b>⊞</b> ETS5™					
ETS			_* <sup>n</sup> %		0
Overview	Bus	Catalogs	र् <b>्र</b> Settings		<b>ΚNX</b>
Your Projects	s Project Arc	hive		KNX News	New KNX Products
+ 🗷 🛃 ₫		Search	Q	Modern, Massive, Moscow – The 15th KNX National Group	True Presence® < > Multisensor KNX
Name Last Mo	odified ▼ Status			Conference kicked off with many surprises 2019/10/7	Steinel GmbH (Germany)
HDL 2019/10/	/12 14:22 Unknow	n		This year, the 15th KNX National Group Conference welcomed delegates from 20 countries. Hosting city was Moscow – Not known by many, but appreciated by all. The first day's agenda had various surprises for the delegates regarding the future of	
		NVA Association, Tools, and upcoming events. The day after followed with additional presentations and discussion on Social Media activites, best practices and other open subject were discussed between KNX and its National Groups Although both days required the full attention of the delegates, all delegates are anticipating the next day with high excitement.	7 senses for KNX. Welcome to the new era in building sensor technology! True Presence® provides absolutely reliable information on human presence and absence. The revolutionary technology is based on ultra-sensitive high-		
				NETx Multi Protocol Server	Certified KNX Products See a list of all certified KNX products here.
				ETS Version ETS 5.6.4 (Build	842) 1 License Demo Apps 0 active

Figure 1-6 Import projects



## 1.2 Open Configuration Window

Double click projects to be configured to open the project window. And click "Workspace"  $\rightarrow$  "Open New Panel"  $\rightarrow$  "Topology" to open the window, as shown in Figure 1-7.



Figure 1-7 Open configuration window



## 2 General Setting

In topology skeleton on the left side of the topology page, click devices to be set, and click "General" in "Parameter" option, as shown in Figure 2-1.

	II ETS5™ - HDL (5)							
- 6	ETS Edit Workplace Commissioning Diagnostics Extras Window							
	Close Project	🆍 Undo 🛛 🐴 F	Redo 🚔 Reports 📕 Workplace 🔻	Catalogs 🔤 Diagnostics				
То	opology 🔻				▲ □	< <		
+	Add Channels   🔻	🗙 Delete   붗 Dov	vnload  🔹 🕜 Help 🌛 Highlight Changes	Default Parameters				
> ⊨	1.1.1 M/EA3.16	5.1 > General						
1.1.1	General		System delay[1255] after voltage recovery	5	* *			
M/EA	Channel Al		Heartbeat telegram	Disable	•			
3.16.1	Channel A		Health monitor	O Disable C Enable				
	Channel B		Note:Current range settings					
	Channel C		Channel A current range	16A(relay can control) current transformer(relay always	on)			
			Channel B current range	16A(relay can control) current transformer(relay always	on)			
			Channel C current range	<ul> <li>16A(relay can control)</li> <li>current transformer(relay always</li> </ul>	on)			
			Note:Metering unit setting					
			Metering total unit	🔘 Wh 🔵 kWh				
			Metering A unit	◎ Wh ○ kWh				
			Metering B unit	◎ Wh ○ kWh				
			Metering C unit	◎ Wh ○ kWh				
			Note:Metering overflow setting					
			Metering total overflow value	210000000	 ▼	÷		
	Group Objects	Parameter						
	HDL USB Interface	▲ 1.1 New line	1.1.1 M/EA3.16.1		Last used workspace			

Figure 2-1 General setting

The setting items are explained below:

- 1. System delay after voltage recovery: time-delay function, namely a delay time between powering on the device and activating the system, range from 1 to 255s.
- 2. Heartbeat telegram: to choose to send value "1", "0", or "1, 0" cyclically.

Sending interval of telegram: to set the interval of sending heartbeat telegram, range from 1 to 65535s.



- 3. Health monitor: to enable health monitoring function.
  - > Cycle monitor time: to set the period of health monitoring, range from 1 to 65535s.
  - Health voltage sending unit: to select mV or V as the sending unit of health monitoring voltage.
  - Send health voltage value: to select the sending mode of health monitor voltage, including "after a change", "cyclically" or a combination of both.

If "after a change" is selected, the range of sending can be set in "Send health voltage value" below. Monitoring voltage will be sent when the value is beyond the range, range from 1 to 65535mV.

If "cyclically" is selected, the period of sending can be set in "Cycle time" below, range from 1 to 65535s.

- Send health voltage value on request: to enable sending health monitoring voltage after receiving requests. After enabled, users may select signal types below.
- Alarm after unhealth voltage: to enable to send an alarm when unhealthy status is monitored. After enabled, users may set the lower/upper limit of health voltage (both range from 0 to 255V) below. Beyond the range is defined as unhealthy status.
- 4. Current range setting

This section is to set the range of current for 3 circuits (A/B/C) independently by "16A" or "Current transformer". If the latter is selected, the ratio of current to 5A can be set below.

5. Metering total unit setting

This section is to set the unit for the main circuit and 3 circuits (A/B/C) independently, including "Wh" or "kWh".

6. Metering overflow setting

This section is to set overflow value for the main circuit and 3 circuits (A/B/C) independently. And users may enable "warning jump to 0" or disable "No warning jump to 0" below.

Notice: If external current transformer is used, the circuit will be kept ON.

- 7. All channels operation: to enable the full-open/full-close function of relay.
  - Switching ON/OFF: to control all the switches after enabled. The switch mode can be selected below, including "'1'-ON, '0'-OFF" and "'0'-ON, '1'-OFF".
  - Status: to activate/deactivate feedback function. The mode can be selected, including "'1'-Channels is ON, else '0'' and "'0'-Channels is ON, else '1''.

## 3 Channel All Setting

#### 3.1 Function Selection

In topology skeleton on the left side of topology page, click the device to be set and select "Channel All" in "Parameter" option, as shown in Figure 3-1.

ETS	S5™ - HDL (5)						- • •	
ETS Edit Workplace Commissioning Diagnostics Extras Window								
	🔇 Close Project 🌾 Undo 🆓 Redo 🚔 Reports 📰 Workplace 🔻 🧾 Catalogs 💽 Diagnostics							
Торо	ology 🔻						<u>^ □ × &lt;</u>	
🕂 Add Channels 💌 🗙 Delete 붗 Download 💌 🕜 Help 🥒 Highlight Changes 🛛 Default Parameters								
) 1 ⊨	I.1.1 M/EA3.16.1 > Cha	nnel All				_		
1.1.1	General		Metering total	O Disable	O Enable		Ö	
M/EA:	Channel All		Active power total	O Disable	Enable		· · · · ·	
3.16.1	All: Metering	1	Current total	O Disable	Enable	3		
	All: Active Power		Frequency	<ul> <li>Disable</li> </ul>	O Enable			
	All: Current	4	Device as load master	O Disable	O Enable			
	All: Frequency		Metering calculator	O Disable	O Enable			
	All: Load Master					-		
_	All: Metering calculator	r						
	Channel A							
	Channel B							
	Channel C							
	Group Objects	antar //	1)					
HD	L USB Interface	1.1 New line	1.1.1 M/EA3.16.1			Last used worksp	Jace	

Figure 3-1 Function selection

Click "Enable" to enable corresponding functions and corresponding tabs will show up on the left.



## 3.2 All: Metering Setting

"All: Metering setting" page is as shown in Figure 3-2.

I	ETS5™ - HDL (5)					×
	ETS Edit Workplace Commission	ning Diagnostics Extras Window				^ 🕜
	🚡 Close Project 🛛 🎸 Undo 🛛 🔌 F	Redo 📄 Reports 🔛 Workplace 🔻	Catalogs Diagr	nostics		
Т	opology 🔻				∧ ⊡ ×	<
+	• Add Channels   🔹 🗙 Delete  붗 Dow	vnload   🔻 🕜 Help 🌛 Highlight Changes 🛛	Default Parameters			
>	1.1.1 M/EA3.16.1 >All: Meterin					
1.1.1	General	Send <meter reading="" total=""> after a change</meter>	No Yes		^	
M/EA3	Channel All	Send <meter reading="" total=""> on request</meter>	No Ves			
3.16.1	All: Metering	Send <meter reading="" total=""> cyclically</meter>	O No Ves			
	All: Active Power	All meters and Inter-meters reset via object	No Yes			
	All: Current	NOTE-Intermediate mater(Inter-Mater)				
	All: Frequency	Send <inter-meter reading="" total=""> after a</inter-meter>	◎ No ○ Yes			
	All: Load Master	Send <inter-meter reading="" total=""> on</inter-meter>	No Yes			
	All: Metering calculator	request Send <inter-meter reading="" total=""></inter-meter>				
	Channel A	cyclically	1 bit object time	Default Value: No		
	Channel B	Reset <inter-meter reading="" total=""> after</inter-meter>	No     Yes			
	Channel C	started Send <inter-meter reading="" total=""> after started</inter-meter>	No Yes			
		Inter-meter total is stoped by	1 bit object	•		
		Restart <inter-meter reading="" total=""> after stoped</inter-meter>	No Yes			
		Warning to stop	do not send	•		
	Group Objects Parameter	Reset <inter-meter reading="" total=""> via</inter-meter>	<u></u>		•	
	HDL USB Interface 1.1 New line	1.1.1 M/EA3.16.1			Last used workspace	

Figure 3-2 All: metering setting

The setting items are explained as follows:

- 1. Send <Meter reading total> after a change: to enable sending deviation value when total meter changes. After enabled, deviation value can be set in "Wh", range from 1 to 65535Wh.
- 2. Send <Meter reading total> on request: to enable sending total meter when receiving commands. After enabled, the format of command can be set in "Request with object value" below.
- 3. Send <Meter reading total> on cyclically: to enable sending total meter cyclically. After enabled, change the time for sending, range from 1 to 65535s.



- 4. All meters and Inter-meters reset via object: to enable resetting total meter and intermeter via objects.
- 5. Send <Inter-meter reading total> after a change: to enable sending deviation value when total inter-meter changes. After enabled, deviation value can be set in "Wh" below, range from 1 to 65535 Wh.
- 6. Send <Inter-meter reading total> on request: to enable sending total inter-meter when receiving commands. After enabled, set the format of command in "Request with object value" below.
- 7. Send <- reading total> cyclically: to enable sending total inter-meter cyclically. After enabled, the time for sending can be set below, range from 1 to 65535s.
- 8. Inter-meter total is started by: to select inter-meter starts by 1-bit object or time. If the latter is selected, the time can be set below, including hour, minute and week.
- 9. Reset <Inter-meter reading total> after started: to enable resetting total inter-meter when the counting starts.
- 10. Send <Inter-meter reading total> after started: to enable sending total inter-meter when the counting starts.
- 11. Inter-meter total is stopped by: to select the way of stopping inter-meter, including "1 bit", "time", "limit", "duration". The details can be set below.

Except "time" option, other options can go further to set items, including restarting total inter-meter reading when the counting stops and choosing whether to send an alarm after total inter-meter stops below.

- 12. Reset <Inter-meter reading total> after started: to enable resetting total inter-meter via objects.
- 13. Inter-meter parameter after bus voltage recovery: to select the status of inter-meter parameter after the bus voltage recovery, including "unchanged" and "recovery".



### 3.3 All: Active Power Setting

"All: Active Power setting" page is as shown in Figure 3-3.

	ETS5™ - HDL (5)				×
	TS Edit Workplace Commission	ning Diagnostics Extras Window			
	🔉 Close Project 🛛 🌾 Undo 🛛 🔌 F	Redo 📄 Reports 🔛 Workplace 🔻	Catalogs Diagnostics		
То	ppology 🔻			▲ □ <mark>×</mark>	<
🕂 Add Channels 💌 🗙 Delete 🛨 Download 💌 😮 Help 🥒 Highlight Changes Default Parameters					
> =	1.1.1 M/EA3.16.1 >All: Active F				
1.1.1	General	Send <active power="" total=""> after a change</active>	No Yes		
M/EA	Channel All	Send <active power="" total=""> on request</active>	No Ves		
3.16.1	All: Metering	Send <active power="" total=""> cyclically</active>	No Yes		
	All: Active Power	Enable Threshold 1	No Yes		
	All: Current				
	All: Frequency				
	All: Load Master				
	All: Metering calculator				
	Channel A				
	Channel B				
	Channel C				
	Group Objects Parameter				
	HDL USB Interface 1.1 New line	1.1.1 M/EA3.16.1		Last used workspace	

Figure 3-3 All: active power setting

The setting items are explained as follows:

- 1. Send <Active power total> after a change: to enable sending deviation value when total active power changes. Deviation value can be set below, range from 1 to 65535W.
- 2. Send <Active power total> on request: to enable sending total active power when receiving commands. After enabled, the format of command can be set below.
- 3. Send <Active power total> cyclically: to enable sending total active power cyclically. After enabled, set the time for sending cyclically below, range from 1 to 65535s.
- 4. Enable Threshold 1: to enable "Threshold 1". After enabled, the details can be set below.

> Threshold parameter after bus voltage recovery: to select the status of threshold

14



parameter after the bus voltage recovery, including "unchanged" and "recovery".

- Threshold 1 lower/upper limit: to select the maximum/minimum of "Threshold 1", both range from 0 to 65535W.
- Threshold warning: to choose whether to send an alarm when actual threshold exceeds the limit, including "do not send", "send 0 when exceeding", "send 1 when exceeding", "send 0 when falling below", "send 1 when falling below", "exceeding 0, falling below 1" and "exceeding 0, falling below 1".
- 5. Enable Threshold 2/3/4: to enable "Threshold 2/3/4", which is set in the same way as "Threshold 1".

### 3.4 All: Current Setting

"All: Current setting" page is as shown in Figure 3-4.

Ħ	ETS5™ - HDL (5)				<b>.</b>
	ETS Edit Workplace Commission	ning Diagnostics Extras Window			^ 🕜
	🔉 Close Project 🛛 🏠 Undo 🛛 🐴 F	Redo 🚔 Reports 🔛 Workplace 🔻	📃 Catalogs 🔤 Diagnost	ics	
Т	opology 🔻			▲ □ ×	<
+	• Add Channels   🔹 🗙 Delete  🛨 Dov	vnload 🛛 🔹 🕜 Help 🌙 Highlight Changes	Default Parameters		
>	1.1.1 M/EA3.16.1 >All: Current	:			
1.1.1	General	Send <current total=""> after a change</current>	No Yes		0
M/EA	Channel All	Send <current total=""> on request</current>	🔘 No 🗌 Yes		
3.16.1	All: Metering	Send <current total=""> cyclically</current>	No Yes		
	All: Active Power	Enable Threshold 1	No Yes		
	All: Current	1			
	All: Frequency				
	All: Load Master				
	All: Metering calculator				
	Channel A				
	Channel B				
	Channel C				
	Group Objects Parameter				
	HDL USB Interface 1.1 New line	1.1.1 M/EA3.16.1		Last used workspace	.4

Figure 3-4 All: current setting



The setting items are explained as follows:

- 1. Send <Current total> after a change: to enable sending deviation value when total current changes. After enabled, deviation value can be set below, range from 1 to 20000mA.
- 2. Send <Current total> on request: to enable sending total current when receiving commands. After enabled, the format of command can be set below.
- 3. Send <Current total> cyclically: to enable sending total current cyclically. After enabled, the time for sending cyclically can be set below, range from 1 to 65535s.
- 4. Enable Threshold 1: to enable "Threshold 1", the details can be set below.
  - Threshold parameter after bus voltage recovery: to select the status of threshold parameter after the bus voltage recovery, including "unchanged" and "recovery".
  - Threshold 1 lower/upper limit: to select the maximum/minimum of "Threshold 1", range from 0 to 200A.
  - Threshold warning: to choose whether to send and alarm when actual threshold exceeds the limit, including "do not send", "send 0 when exceeding", "send 1 when exceeding", "send 0 when falling below", "send 1 when falling below", "exceeding 0, falling below 1" and "exceeding 0, falling below 1".
- 5. Enable Threshold 2/3/4: to enable "Threshold 2/3/4", which is set in the same way as "Threshold 1".

## 3.5 All: Frequency Setting

"All: Frequency" page is as shown in Figure 3-5.

Ħ	ETS5™ - HDL (5)				×
-	ETS Edit Workplace Commissio	ning Diagnostics Extras Window		·	
	🔉 Close Project 🛛 🏠 Undo 🛝	Redo 🚔 Reports Workplace	<ul> <li>Catalogs Diagnostics</li> </ul>		
Тс	opology 🔻			▲ @ 🗙	<
+	🛛 Add Channels   🔹 🗙 Delete  🛨 Do	wnload   🔻 🕜 Help 🌛 Highlight Change	s Default Parameters		
> =	1.1.1 M/EA3.16.1 >All: Freque	ncy			
1.1.1	General	Send <frequency> after a change</frequency>	No Yes		0
M/E/	Channel All	Send <frequency> on request</frequency>	🔘 No 🗌 Yes		×.
<b>\3.16.1</b>	All: Metering	Send <frequency> cyclically</frequency>	No Yes		
	All: Active Power	Enable Threshold 1	No Yes		
	All: Current				
	All: Frequency				
	All: Load Master				
	All: Metering calculator				
	Channel A				
	Channel B				
	Channel C				
	Group Objects Parameter				
	HDL USB Interface 1.1 New line	1.1.1 M/EA3.16.1		Last used workspace	

Figure 3-5 All: Frequency setting

The setting items are explained as follows:

- 1. Send < Frequency> after a change: to enable sending deviation value when the frequency changes. After enabled, deviation value can be set below, range from 1 to 650Hz.
- 2. Send <Frequency> on request: to enable sending frequency when receiving commands. After enabled, the format of command can be set below.
- 3. Send <Frequency> cyclically: to enable sending frequency cyclically. After enabled, the time for sending cyclically can be set below, range from 1 to 65535s.
- 4. Enable Threshold 1: to enable "Threshold 1", the details can be set below.



- Threshold parameter after bus voltage recovery: to select the status of threshold parameter after the bus voltage recovery, including "unchanged" and "recovery".
- Threshold 1 lower/upper limit: to select the maximum/minimum of "Threshold 1", range from 1 to 650Hz.
- Threshold warning: to choose whether to send an alarm when actual threshold exceeds the limit, including "do not send", "send 0 when exceeding", "send 1 when exceeding", "send 0 when falling below", "send 1 when falling below", "exceeding 0, falling below 1" and "exceeding 0, falling below 1".
- 5. Enable Threshold 2/3/4: to enable "Threshold 2/3/4", which is set in the same way as "Threshold 1".

## 3.6 All: Load Master Setting

"All: Load Master setting" page is as shown in Figure 3-6.

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	🔉 Close Project 🛛 🌾 Undo 🛝 F	Redo 🦳 Reports Workplace 🔻	Catalogs Diagnostics		
Το	pology 🔻				<
+	Add Channels 💌 🗙 Delete 🛨 Dow	vnload   🔻 🕜 Help 🌛 Highlight Changes 🛛	Default Parameters		
>	1.1.1 M/EA3.16.1 >All: Load M	aster			
111	General	The number of load cutdown stages[18]	1	▲ ▼	0
L M/EA	Channel All	Load control through	◎ active power ○ current		1
3.16.	All: Metering	Load limit in W[0200,000]	5000	* *	
4	· · · · · · · · · · · · · · · · · · ·	Load limit can be changed by object	No Yes		
	All: Active Power	Load limit after bus voltage recovery	unchanged recovery		
	All: Current	Load slave power value1	External via communication object	•	
	All: Frequency	Load slave power value2	External via communication object	•	
	All: Load Master	Load slave power value3	External via communication object	•	
		Load slave power value4	External via communication object	•	
	All: Metering calculator	The number of additional power values	0	* *	
	Channel A	Monitor values cyclically			
	Channel B	Reaction time when exceeding load limit		-	
	Channel C	in s[2255]	2	The second secon	
	Channel C	Reaction time when falling below load limit in s[265535]	300	▲ ▼	
		Hysteresis for increasing load cutdown stages in % load limit[0100]	0	▲ ▼	
		Object Deactivate load control(master)at	unchanged	•	
		, or bus voltage			
	Group Objects Parameter				
ł	HDL USB Interface	1.1.1 M/EA3.16.1		Last used workspace	

Figure 3-6 All: Load Master setting



The setting items are explained as follows:

- 1. The number of load cutdown stages: to set the number of slave loads, range from 1 to 8.
- 2. Load control through: to select to control loads by active power or current. The third option differs from the sixth option according to this selection.
- 3. Load limit: to set the limit of loads. When active power is selected, the range is from 0 to 200000W. When the current is selected, the range is from 0 to 200A.
- 4. Load limit can be changed by object: to enable changing load limit via objects.
- 5. Load limit after bus voltage recovery: to select the status of load limit after the bus voltage recovery, including "unchanged" and "recovery".
- 6. Load slave power/current value 1/2/3/4: to select the source of slave power/current, including "Active power" and "External via communication object".
- 7. The number of additional power values: to set the number of additional power, range from 0 to 6.
- 8. Monitor values cyclically: to enable monitoring cyclically. After enabled, change the interval of monitoring below, range from 20 to 65535s.
- 9. Reaction time when exceeding load limit: to set the reaction time of exceeding the upper limit of load, range from 2 to 255s.
- 10. Reaction time when falling below load limit: to set the reaction time of falling below the lower limit of load, range from 2 to 65535s.
- 11. Hysteresis for increasing load cutdown stages in % load limit: to set the bandwidth of load limit, range from 0 to 100%.
- 12. Object Deactivate load control (master) at recovery of bus voltage: to set whether to disable load control function after the device is powered on again, including "unchanged", "load control activated" and "load control deactivated".



## 3.7 All: Metering Calculator Setting

"All: Metering calculator setting" page is as shown in Figure 3-7.

	ETS5™ - HDL (5)			_ • •
	ETS Edit Workplace Commission	ning Diagnostics Extras Window		^ <b>(</b> )
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T	opology 🔻			▲ □ × <
+	🛚 Add Channels   🔻 🗙 Delete   붗 Dov	wnload 🛛 🔻 🕜 Help 🥒 Highlight Changes	Default Parameters	
> =	1.1.1 M/EA3.16.1 >All: Meterin	ng calculator		
1.1.1	General	Send <meter calc="" reading=""> after a change</meter>	◎ No ○ Yes	Ŏ
M/EA3	Channel All	Send <meter calc="" reading=""> on request</meter>	◎ No ○ Yes	
.16.1	All: Metering	Send <meter calc="" reading=""> cyclically</meter>	No Yes	
	All: Active Power	Define metering calc value	🗌 Disable 🔘 Enable	
	All: Current	Meter value 2	none T	
	All: Frequency	Meter value 3	none	
	All: Load Master	Meter value 4	none 🔻	
	All: Metering calculator	Enable more external meter value object	◎ No ○ Yes	
	Channel A			
	Channel B			
	Channel C			
	Group Objects Parameter			
	HDL USB Interface 1.1 New line	1.1.1 M/EA3.16.1	Last used v	vorkspace

Figure 3-7 All: metering calculator setting

The setting items are explained as follows:

- 1. Send <Meter reading cal> after a change: to enable sending deviation value when meter cal changes. After enabled, deviation value can be set below, range from 1 to 65535wh.
- 2. Send <Meter reading cal> on request: to enable sending meter cal when receiving commands. After enabled, the format of command can be set below.
- 3. Send <Meter reading cal> after a cyclically: to enable sending meter cal cyclically. After enabled, the time for sending cyclically can be set below, range from 1 to 65535s.
- 4. Define metering cal value: to enable defining metering cal. After enabled, meter cal 1/2/3/4 can be selected independently from "Meter A/B/C/Total" or "External via communication object".



## 4 Channel A/B/C Setting

This chapter takes "Channel A" as an example to introduce the function and setting of single channel.

#### 4.1 Function Selection

Click "Parameter"  $\rightarrow$  "Channel A", as shown in Figure 4-1. After selecting corresponding functions, corresponding tabs will show up on the left.

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Т	opology 🔻		▲ ti	<b>X</b>	<
F+	🛚 Add Channels   🔹 🗙 Delete  🛨 Dow	rnload   🔹 😮 Help 🥒 Highlight Changes	Default Parameters		
> =	1.1.1 M/EA3.16.1 > Channel A				
1.1.1	General	Metering	O Disable O Enable		0
M/EA	Channel All	Active power	Oisable O Enable		
3.16.1	Channel A	Current	O Disable 🔘 Enable		
	A: Metering	Voltage	Disable Disable		
	A: Active Power	Apparent power	Disable Enable		
		Send <apparent power=""> after a chang</apparent>	je 🔘 No 🕖 Yes		
	A: Current	Send <apparent power=""> on request</apparent>	◎ No ○ Yes		
	A: Voltage	Send <apparent power=""> cyclically</apparent>	◎ No ○ Yes		
	A: Energy Saving	Power factor	O Disable O Enable		
	Channel B	Send <power factor=""> after a change</power>	◎ No		
	Channel C	Send <power factor=""> on request</power>	No Yes		
		Send <power factor=""> cyclically</power>	O No Ves		
		Channel as load slave(only 16A)	O Disable C Enable		
		Switch actuator(only 16A)	O Disable  Enable		
		Energy saving	🗌 Disable 🔘 Enable		
	Group Objects Parameter				
	HDL USB Interface 1.1 New line	1.1.1 M/EA3.16.1	Last used workspace		

Figure 4-1 Function selection



#### 4.2 Apparent Power and Power Factor Setting

In "Channel A" page, apparent power and power factor can be set, whose setting items are similar.

Notice: in the following options, \* represents "Apparent power" or "Power factor".

- Send <\*> after a change: to enable sending deviation value when apparent power/power factor changes. After enabled, deviation value can be set below, range from 1-65535VA (apparent power)/0.01×(1-100) (power factor).
- 2. Send <\*> on request: to enable sending apparent value/power factor when receiving commands. After enabled, the format of command can be set below.
- 3. Send <\*>> cyclically: to enable sending apparent value/power factor cyclically. After enabled, the interval of sending cyclically can be set below, range from 1 to 65535s.

#### 4.3 Metering Setting

After enabling "Metering" in "Channel A" page, "A: Metering" tab will show up on the left. Click to open the page, as shown in Figure 4-2.

## HDL

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	Edit Workplace Commission	ning Diagnostics Extras Window		^ (	?
	🔉 Close Project 🛛 🏠 Undo 🛛 🔌 F	Redo 🚔 Reports 📕 Workplace 🔹	Catalogs Diagnostics		
Т	opology 🔻			∧ □ ×	¢
+	🛚 Add Channels   🔹 🗙 Delete  🛨 Dov	wnload   🔻 🕜 Help 🤌 Highlight Changes 🛛	Default Parameters		Ì
> ⊨	1.1.1 M/EA3.16.1 >A: Metering	9			i
1.1.1	General	Send <meter reading=""> after a change</meter>	O No Yes		
M/EA	Channel All	Send <meter reading=""> on request</meter>	O No Ves		
3.16.1	Channel A	Send <meter reading=""> cyclically</meter>	◎ No ○ Yes		
	A: Metering	NOTE:Intermediate meter(Inter-Meter)			
	A: Active Power	Send <inter-meter reading=""> after a change</inter-meter>	◎ No ○ Yes		
	A: Current	Send <inter-meter reading=""> on request</inter-meter>	O No Ves		
	A: Voltage	Send <inter-meter reading=""> cyclically</inter-meter>	O No Ves		
	A: Energy Saving	Inter-meter is started by	1 bit object time		
	Channel B	Reset <inter-meter reading=""> after started</inter-meter>	O No Ves		
	Channel C	Send <inter-meter reading=""> after started</inter-meter>	O No Ves		
		Inter-meter is stoped by	1 bit object	•	
		Restart <inter-meter reading=""> after stoped</inter-meter>	◎ No ○ Yes		
		Warning to stop	do not send	•	
		Reaction to stop	no contact	•	
		Reset <inter-meter reading=""> via object</inter-meter>	No Ves		
		Inter-meter parameter after bus voltage	O unchanged C recovery	v	
	Group Objects Parameter				
	HDL USB Interface A 1.1 New line	1.1.1 M/EA3.16.1		Last used workspace	

Figure 4-2 Metering setting

The setting items are explained as follows:

- 1. Send <Meter reading total> after a change: to enable sending deviation value when meter changes. After enabled, deviation value can be set below, range from 1 to 65535wh.
- 2. Send <Meter reading> on request: to enable sending meter when receiving commands. After enabled, the format of command can be set below.
- 3. Send <Meter reading> cyclically: to enable sending meter cyclically. After enabled, the time for sending cyclically can be set below, range from 1 to 65535s.
- Send <Inter-meter reading> after a change: to enable sending deviation value when intermeter value changes. After enabled, deviation value can be set in "Wh" below, range from 1 to 65535wh.
- 5. Send <Inter-meter reading> on request: to enable sending inter-meter when receiving commands. After enabled, the format of command can set in "Request with object value"



below.

- 6. Send <Inter-meter reading> cyclically: to enable sending inter-meter cyclically. After enabled, the time for sending cyclically can be set below, range from 1 to 65535s.
- 7. Inter-meter is started by: to set that inter-meter is started by 1-bit object or time. If the latter is selected, the time can be set below, including hour, minute and week.
- 8. Reset <Inter-meter reading > after started: to enable resetting total inter-meter reading when the counting starts.
- 9. Send<Inter-meter reading > after started: to enable sending total inter-meter when the counting starts.
- 10. Inter-meter total is stopped by: to select the way of stopping inter-meter, including "1-bit object", "time", "limit", "duration". The details can be set below.

Except "time" option, other options can go further to set items, including restarting total inter-meter reading when the counting stops and choosing whether to send an alarm after total inter-meter stops below.

- 11. Reset <Inter-meter reading > after started: to enable resetting inter-meter via objects.
- 12. Inter-meter parameter after bus voltage recovery: to select the status of inter-meter parameter after the bus voltage recovery, including "unchanged" and "recovery".

#### 4.4 Active Power Setting

After enable "Active Power" in "Channel A" page, "A: Active Power" tab will show up on the left. Click to open the page, as shown in Figure 4-3.

## HDL

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T	opology 🔻			∧ □ ×	<
t t	🛚 Add Channels   🝷 🗙 Delete 🛛 🛨	Download   🔻 🕜 Help 🥒 Highlight Changes	Default Parameters		
> ∎	1.1.1 M/EA3.16.1 >A: Active	e Power			
1.1.1	General	Send <active power=""> after a change</active>	No Yes		Ŏ
M/E/	Channel All	Send <active power=""> on request</active>	🔘 No 🔵 Yes		
\3.16.1	Channel A	Send <active power=""> cyclically</active>	O No Ves		
	A: Metering	Enable Threshold 1	No Yes		
	A: Active Power				
	A: Current				
	A: Voltage				
	A: Energy Saving				
	Channel B				
	Channel C				
	Group Objects Parameter			Last used werkeness	
	The obstituenace - T.T.New I	IIIE I.I.I M/EA3.16.1		Last used workspace	

Figure 4-3 Active power setting

The setting items are explained as follows:

- 1. Send < Active Power> after a change: to enable sending deviation value when active power changes. After enabled, deviation value can be set in "Wh", range from 1 to 65535Wh.
- 2. Send <Active Power> on request: to enable sending active power when receiving commands. After enabled, the format of command can be set below.
- 3. Send <Active Power> cyclically: to enable sending active power cyclically. After enabled, the time for sending cyclically can be set below, range from 1 to 65535s.
- 4. Enable Threshold 1: to enable "Threshold 1". After enabled, the details can be set below.
  - Threshold parameter after bus voltage recovery: to select the status of threshold parameter after the bus voltage recovery, including "unchanged" and "recovery".
  - > Threshold 1 lower/upper limit: to select the maximum/minimum of "Threshold 1",



range from 0 to 65535W.

- Threshold warning: to choose whether to send an alarm when actual threshold exceeds the limit, including "do not send", "send 0 when exceeding", "send 1 when exceeding", "send 0 when falling below", "send 1 when falling below", "exceeding 0, falling below 1" and "exceeding 0, falling below 1".
- 5. Enable Threshold 2/3/4: to enable "Threshold 2/3/4", which is set in the same way as "Threshold 1".

## 4.5 Current Setting

After enabling "Current" in "Channel A" page, "A: Current" tab will show up on the left. Click to open the page, as shown in Figure 4-4.

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	ETS Edit Workplace Commission	ning Diagnostics Extras Window		^	
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Т	opology 🔻			∧ ⊡ ×	<
+	= Add Channels   🔹 🗙 Delete   🛨 Dov	wnload   🔻 🕜 Help 🤌 Highlight Changes	Default Parameters		
> =	1.1.1 M/EA3.16.1 >A: Current				
1.1.1	General	Send <current> after a change</current>	O No Ves		0
. M/EA	Channel All	Send <current> on request</current>	No Ves		*
3.16.1	Channel A	Send <current> cyclically</current>	O No Ves		
	A: Metering	Enable Threshold 1	No Ves		
	A: Active Power				
	A: Current	a			
	A: Voltage				
	A: Energy Saving				
	Channel B				
	Channel C				
	Group Objects Parameter				
	HDL USB Interface 1.1 New line	1.1.1 M/EA3.16.1		Last used workspace	

Figure 4-4 Current setting



The setting items are explained below:

- 1. Send <Current> after a change: to enable sending deviation value when frequency changes. Deviation value can be set below, range from 1 to 20000mA.
- 2. Send <Current> on request: to enable sending current when receiving commands. After enabled, the format of command can be set in "Request with object value" below.
- 3. Send <Current> cyclically: to enable sending current cyclically. After enabled, the time for sending cyclically can be set below, range from 1 to 65535s.
- 4. Enable Threshold 1: to enable "Threshold 1". After enabled, the details can be set below.
  - Threshold parameter after bus voltage recovery: to select the status of threshold parameter after the bus voltage recovery, including "unchanged" and "recovery".
  - Threshold 1 lower/upper limit: to select the maximum/minimum of "Threshold 1", range from 0 to 200A.
  - Threshold warning: to choose whether to send an alarm when actual threshold exceeds the limit, including "do not send", "send 0 when exceeding", "send 1 when exceeding", "send 0 when falling below", "send 1 when falling below", "exceeding 0, falling below 1" and "exceeding 0, falling below 1".
- 5. Enable Threshold 2/3/4: to enable "Threshold 2/3/4", which is set in the same way as "Threshold 1".

#### 4.6 Voltage Setting

After enabling "Voltage" in "Channel A" page, "A: Voltage" will show up on the left. Click to open the page, as shown in Figure 4-5.

## HDL

Ħ	ETS5™ - HDL (5)			
	ETS Edit Workplace Commiss	ioning Diagnostics Extras Window		^ <b>(</b>
	🗴 Close Project 🛛 🏠 Undo 🛛 🔍	🖌 Redo 🛛 🚔 Reports 📰 Workplace	e 🔻 📗 Catalogs 🛛 🔤 Diagnostics	
Т	opology 🔻			▲ □ ×
+	🛚 Add Channels   🔹 🗙 Delete  🛨 🛛	Download   🔻 🕜 Help 🤌 Highlight Chang	es Default Parameters	
> ⊨	1.1.1 M/EA3.16.1 >A: Voltag	je		
1.1.1	General	Send <voltage> after a change</voltage>	O No Ves	0
M/EA	Channel All	Send <voltage> on request</voltage>	No Yes	
3.16.1	Channel A	Send <voltage> cyclically</voltage>	No Ves	
	A: Metering	Enable Threshold 1	O No Ves	
	A: Active Power			
	A: Current			
	A: Voltage			
	A: Energy Saving			
	Channel B			
	Channel C			
	Group Objects Parameter	/		
	HDL USB Interface 1.1 New lin	ne 1.1.1 M/EA3.16.1		Last used workspace

Figure 4-5 Voltage setting

The setting items are explained as follows:

- 1. Send < Voltage> after a change: to enable to send deviation value when voltage changes. After enabled, deviation value can be set below, rang from 1 to 265V.
- 2. Send <Voltage> on request: to enable sending voltage when receiving commands. After enabled, the format of command can be set in "Request with object value" below.
- 3. Send <Voltage> cyclically: to enable sending voltage cyclically. After enabled, the time for sending cyclically can be set below, range from 1 to 65535s.
- 4. Enable Threshold 1: to enable "Threshold 1". After enabled, the details can be set below.
  - Threshold parameter after bus voltage recovery: to select the status of threshold parameter after the bus voltage recovery, including "unchanged" and "recovery".
  - Threshold 1 lower/upper limit: to select the maximum/minimum of "Threshold 1", range from 0 to 265V.



- Threshold warning: to choose whether to send an alarm when actual threshold exceeds the limit, including "do not send", "send 0 when exceeding", "send 1 when exceeding", "send 0 when falling below", "send 1 when falling below", "exceeding 0, falling below 1" and "exceeding 0, falling below 1".
- 5. Enable Threshold 2/3/4: to enable "Threshold 2/3/4", which is set in the same way as "Threshold 1".

## 4.7 Energy Saving

After enabling "Energy Saving" in "Channel A" page, "A: Energy Saving" tab will show up on the left. Click to open the page, as shown in Figure 4-6.

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Т	opology 🔻			∧ □ × <
+	Add Channels   🔹 🗙 Delete 🚽	🛛 Download   🔹 🕜 Help 🌛 Highlight C	hanges Default Parameters	
> =	1.1.1 M/EA3.16.1 >A: Ene	rgy Saving		
1.1.1	General	Enable thrershold 1	Disable Enable	0
M/EA	Channel All	Enable thrershold 2	Disable Enable	
3.16.1	Channel A	Enable thrershold 3	Disable Enable	
	A: Metering	Enable thrershold 4	Disable Enable	
	A: Active Power			
	A: Current			
	A: Voltage			
	A: Energy Saving			
	Channel B			
	Channel C			
	Group Objects Parameter			
	HDL USB Interface	v line 1.1.1 M/EA	3.16.1	Last used workspace

Figure 4-6 Energy saving setting

The energy-saving mode is that operations to set objects and close other appliances will be



activated when the current exceeds current limit.

The energy-saving mode of each circuit includes 4 thresholds, this part takes the first threshold of circuit A as an example to explain.

- 1. Current limit threshold 1 in 100mA: current threshold, whose unit is 100mA, range from 0 to 200, namely range from 0 to 2000mA.
- 2. Tolerance: the bandwidth of current threshold, range from 0 to 30%.
- 3. Delay for sending objects: to set the delay time of sending objects, range from 0 to 65535s.
- 4. Switch object: to enable sending switch objects. After enabled, ON or OFF can be set in "Send telegram" below.
- 5. Value object: to enable to send 1-byte objects. After enabled, Objects can be set in "Send telegram" below, range from 0 to 255.
- 6. Dimming object: to enable to send the value of dimming. After enabled, Objects can be set in "Send telegram" below after enabled.
- 7. Scene object: to enable sending scene objects. After enabled, Objects can be set in "Send telegram" below, range from 0 to 63.
- 8. Temperature object: to enable sending the value of temperature. After enabled, the unit of temperature can be selected in "Temperature unit" below, including "Celsius" and "Fahrenheit". Objects can be set in "Send telegram", range from 0 to 255.



## 5 Object Instruction

KNX communication objects are used for receiving and sending data. The length of these objects is from 1 to 14 bits according to different function settings. Each object has a flag with communication property.

- 1. "C"-Communication, representing that communication objects are connected normally via the bus.
- 2. "R"-Read, representing that communication objects can be read via the bus.
- 3. "W"-Write, representing that communication objects can be rewritten via the bus.
- 4. "T"-Transmit, representing that communication objects have transmit function. When this object is modified, send the message.
- 5. "U"-Update, representing that communication object can be updated via the bus response message.

Objects	Objects "General"										
序号▲	名称	对象功能		长度	C	R	w	т	U	数据类型	优先级
1	General	Hearbeat telegram	1	bit	С	R	-	Т	-	enable	低
2	General	Health monitor	1	bit	С	R	-	Т	-	switch	低
3	General	Health monitor value	2	bytes	С	R	-	Т	-	voltage (m	.低
4	General	Health value Request	1	bit	С	-	W	-	-	trigger	低
5	General	Receive time	3	bytes	С	-	W	-	-	time of day	低
6	General	Receive load shedding stage	1	byte	С	-	W	-	-		低
7	General	Meter Total overflow warning	1	bit	С	-	-	Т	-	alarm	低
8	General	Meter A overflow warning	1	bit	С	-	-	Т	-	alarm	低
9	General	Meter B overflow warning	1	bit	С	-	-	Т	-	alarm	低
10	General	Meter C overflow warning	1	bit	С	-	-	Т	-	alarm	低
11	General	All Switching ON/OFF	1	bit	С	R	W	Т	-	open/close	低
12	General	All Switching status	1	bit	С	R	-	Т	-	open/close	低
No	Name	Function		Fla	g					Data Typ	e
	Osnaral				<u>т</u>					DPT1.00	3
	General	Heartbeat telegram		Сĸ	I					1 bit	
This o	bject can be activate	d in "Heartbeat Telegram", by	selec	ting	"Se	end	Va	alue	е"	0"cyclicall	y, Senc
value"1	"cyclically, Send valu	e"1/0" inverted cyclically", which	is u	sed f	or	che	eck	ing	w	hether the	e device
connec	ts to the system norm	ally.						-			
				0.0	-					DPT1.00	1
2	General	Health monitor	CRT		1 bit						

## 5.1 Objects "General"



This object is used for reporting whether the bus voltage is healthy.									
				DPT9.020					
3	General	Health monitor value	CRT	2 bytes					
	Concrai		UN I	DPT14.027					
				4 bytes					
These	objects are used for re	porting the data of health monitor	ing.						
1	Conorol	Health value request	C W	DPT1.017					
4	General	Health value request	C VV	1 bit					
This o	bject is used for reques	sts for health monitoring.							
~	Conorol		0.144	DPT10.001					
5	General	Receive time		3 bytes					
6	Conorol	Dessive load shadding stage	C 10/	DPT236.001					
0	General	Receive load shedding stage	C VV	1 byte					
These	objects are used for re	eceiving time and load shedding st	age independently						
7	General	Meter Total overflow warning	СТ						
8	General	Meter A overflow warning	СТ	DPT1.005					
9	General	Meter B overflow warning	СТ	1 bit					
10	General	Meter C overflow warning	СТ						
These objects are used for controlling the overflow warning function of total meter and each meter.									
11	General	All Switching ON/OFF	CRWT	DPT1.009					
12 General All Switching status C R T				1 bit					
These	These objects are used for all switching on/off relays on 3 circuits, indicating full open and full close.								

## 5.2 Objects "All"

## 5.2.1 Objects "All: Meter Total"

Objects function status"All: Meter Total"										
序号 ▲	名称	对象功能	长度 C R	w	τυ	数据类型	优先级			
■2 21	All:Meter total	Meter reading	4 bytes C R	- т	-	active ener.	低			
■22	All:Meter total	Request	1 bit C -	w -	-	trigger	低			
■23	All:Meter total	Reset	1 bit C -	w -	-	reset	低			
No.	Name	Function	Flag	Data Type						
04				DPT13.010						
21	All. Meter Total	meter reading	CRI	4 bytes						
This object	t is used for reporting	g total meter.								
00		Desweet	0.144		DPT1.017					
22	All: weter total	Request		1 bit						



This object is used for requests for reporting total meter.										
23	All: Motor Total	Posot	C W	DPT1.015						
23	All. Meter Total	Resel	0.00	1 bit						
These objects are used for resetting total meter, total inter-meter, circuit meter and circuit inter-meter.										

## 5.2.2 Objects "All: Inter-meter total"

Objects fur	ction status"All: Inte	er-meter total"						
■≵ 24	All:Inter-meter total	Meter reading	4 bytes C R -	T - active ener低				
■2 25	All:Inter-meter total	Request	1 bit C - V	V trigger 低				
■26	All:Inter-meter total	Change start time	3 bytes C R V	V T - time of day 低				
■≵ 27	All:Inter-meter total	Change stop duration	2 bytes C R V	V T - time (min) 低				
■2 28	All:Inter-meter total	Warning	1 bit C R -	T - alarm 低				
■2 29	All:Inter-meter total	Reset	1 bit C - V	V reset 低				
■ <b>‡</b>  30	All:Inter-meter total	Status	1 bit C R -	T - state 低				
No.	Name	Function	Flag	Data Type				
24	All: Inter-meter	Motor roading	ОРТ	DPT13.010				
24	total	Meter reading	UKI	4 bytes				
This objec	t is used for reporting	g total inter-meter.						
	All: Inter-meter		<b>0</b>	DPT1.017				
25	total	1bit						
The object is used for requests for reporting total inter-meter.								
00.07	All: Inter-meter	Trigger 1 bit stort/stop	0.0.00	DPT1.017				
26,27	total	Trigger 1 bit start/stop	CRWI	1 bit				
These obje	ects are used for sta	rting/stopping total inter-met	ter.					
				DPT10.001				
				3 bytes				
	All: Inter-meter	Change start time/stop		DPT13.010				
26,27	total	time/stop limit/stop	CRWT	4 bytes				
		duration		DPT7 006				
				2 bytes				
				2 Dytes				
This objec	t is used for changin	g "start time/stop time/stop l	limit/stop duration".					
				DPT1.005				
				1 bit				
	All: Inter-meter		CRT	DPT1.015				
28,29,30	total	Warning/Reset/Status	C W	1 hit				
	lotai		~ VV					
				DPT 1.010				
				1 bit				
These obje	ects are used for sto	pping total inter-meter warn	ing, resetting total in	ter-meter and				
indicating	the current status of	total inter-meter.						



#### 5.2.3 Objects "All: Active power total"

Objects fur	nction status"All: Act	ive power total"							
■2 31	All:Active power total	Active power	4 bytes C R -	. т.	power (W)	低			
■2 32	All:Active power total	Request	1 bit C - \	w	trigger	低			
<b>2</b> 33	All:Active power total	Threshold lower limit 1	ωт-	power (W)	低				
■2 34	All:Active power total	Threshold upper limit 1	4 bytes C R N	wт-	power (W)	低			
■2 35	All:Active power total	Threshold warning 1	1 bit C R -	. т.	alarm	低			
■2 36	All:Active power total	Threshold lower limit 2	4 bytes C R \	ωт-	power (W)	低			
■2 37	All:Active power total	Threshold upper limit 2	4 bytes C R \	wт-	power (W)	低			
■‡ 38	All:Active power total	Threshold warning 2	1 bit C R -	•т-	alarm	低			
■2 39	All:Active power total	Threshold lower limit 3	4 bytes C R N	wт-	power (W)	低			
■≵ 40	All:Active power total	Threshold upper limit 3	4 bytes C R \	wт-	power (W)	低			
<b>■‡</b>  41	All:Active power total	Threshold warning 3	1 bit C R -	•т-	alarm	低			
■≵ 42	All:Active power total	Threshold lower limit 4	4 bytes C R \	wт-	power (W)	低			
<b>■‡</b>  43	All:Active power total	Threshold upper limit 4	4 bytes C R \	wт-	power (W)	低			
■2 44	All:Active power total	Threshold warning 4	1 bit C R -	• T -	alarm	低			
No.	Name	Function	Flag		Data Typ	be			
0.4	All: Active power	<b>A</b> = 1 <sup>2</sup> = 1 = 1 = 1	0 D T		DPT14.0	56			
31	total	Active power	CRI	4 bytes					
This object is used for reporting total active power.									
-	All: Active power				DPT1.0 <sup>2</sup>	17			
32	total	Request	CW	1 bit					
	total				T DIL				
This objec	t is used for requesti	ng for reporting total active	oower.						
33,36,39	All: Active power	Threshold lower limit			DPT14.056				
,42	total	1/2/3/4	CRWI		4 bytes	6			
34,37,40	All: Active power	Threshold upper limit			DPT14.0	56			
,43	total	1/2/3/4	CRWT		4 bytes	6			
These obj	ects are used for set	ing the upper/lower limit of '	'Threshold 1/2/3/4".						
35.38.41	All: Active power	Threshold warning			DPT1.00	)5			
.44	total	1/2/3/4	CRT		1 bit				
These obj	acts are used for sen	ding an alarm when current	threshold is higher	//owe	than the				
		iung an alann when cullent		nowei					
upper/lower limit.									



## 5.2.4 Objects "All Current total"

Objects fur	nction status"All: Cur	rent total"						
■2 45	All:Current total	Current	4 bytes C R	- T	-	electric cur.	低	
∎≵ 46	All:Current total	Request	1 bit C -	w -	-	trigger	低	
47	All:Current total	Threshold lower limit 1	4 bytes C R	wт	-	electric cur.	低	
■≵ 48	All:Current total	Threshold upper limit 1	4 bytes C R	wт	-	electric cur.	低	
■≵ 49	All:Current total	Threshold warning 1	1 bit C R	- T	-	alarm	低	
■≵ 50	All:Current total	Threshold lower limit 2	4 bytes C R	wт	-	electric cur.	低	
<b>₽</b> ‡ 51	All:Current total	Threshold upper limit 2	4 bytes C R	WТ	-	electric cur.	低	
<b>₽‡</b> 52	All:Current total	Threshold warning 2	1 bit C R	- T	-	alarm	低	
₹ 53	All:Current total	Threshold lower limit 3	4 bytes C R	wт	-	electric cur.	低	
₹ 54	All:Current total	Threshold upper limit 3	4 bytes C R	wт	-	electric cur.	低	
₹ 55	All:Current total	Threshold warning 3	1 bit C R	- T	-	alarm	低	
₹ 56	All:Current total	Threshold lower limit 4	4 bytes C R	wт	-	electric cur.	低	
■≵ 57	All:Current total	Threshold upper limit 4	4 bytes C R	WТ	-	electric cur.	低	
■\$ 58	All:Current total	Threshold warning 4	1 bit C R	- T	-	alarm	低	
No.	Name	Function	Flag			Data Typ	e	
45		0	0.0.7			DPT14.0	19	
45	All: Current total	Current	CRI	4 bytes				
This objec	t is used for reporting	g total current.						
					DPT1.017			
46	All: Current total	Request	CW	1 bit				
This objec	t is used for requesti	ng for reporting total current		-				
47,50,53		Threshold lower limit			DPT14.019			
,56	All: Current total	1/2/3/4	CRWI		4 bytes			
48,51,54		Threshold upper limit				DPT14.0	19	
,57	All: Current total	1/2/3/4	CRWI			4 bytes	i	
These obj	ects are used for set	ting the upper/lower limit of '	'Threshold 1/2/3/4"	-				
49,52,55		Threshold warning		Τ		DPT1.00	)5	
,58	All: Current total	1/2/3/4	CRI		1 bit			
These ob	jects are used for	sending an alarm when c	urrent threshold is	s hi	ghe	er/lower th	nan t	
				(	•			



## 5.2.5 Objects "All: Frequency"

59All:FrequencyFrequency4 bytesCR-T-frequency60All:FrequencyRequest1 bitC-Wtrigger61All:FrequencyThreshold lower limit 14 bytesCRWT-frequency62All:FrequencyThreshold upper limit 14 bytesCRWT-frequency63All:FrequencyThreshold warning 11 bitCR-T-alarm64All:FrequencyThreshold lower limit 24 bytesCRWT-frequency65All:FrequencyThreshold upper limit 24 bytesCRWT-frequency	低低低
60All:FrequencyRequest1 bitC-V r-trigger61All:FrequencyThreshold lower limit 14 bytesCRWT-frequency62All:FrequencyThreshold upper limit 14 bytesCRWT-frequency63All:FrequencyThreshold warning 11 bitCR-T-alarm64All:FrequencyThreshold lower limit 24 bytesCRWT-frequency65All:FrequencyThreshold upper limit 24 bytesCRWT-frequency	低低
61All:FrequencyThreshold lower limit 14 bytes CRWT-frequency62All:FrequencyThreshold upper limit 14 bytes CRWT-frequency63All:FrequencyThreshold warning 11 bitCR-T-alarm64All:FrequencyThreshold lower limit 24 bytes CRWT-frequency65All:FrequencyThreshold upper limit 24 bytes CRWT-frequency	低
62All:FrequencyThreshold upper limit 14 bytes CRWT-frequency63All:FrequencyThreshold warning 11 bitCR-T-alarm64All:FrequencyThreshold lower limit 24 bytes CRWT-frequency65All:FrequencyThreshold upper limit 24 bytes CRWT-frequency	100
63All:FrequencyThreshold warning 11 bitCR-T-alarm64All:FrequencyThreshold lower limit 24 bytesCRWT-frequency65All:FrequencyThreshold upper limit 24 bytesCRWT-frequency	1tt
64     All:Frequency     Threshold lower limit 2     4 bytes C     R     W T     -     frequency       65     All:Frequency     Threshold upper limit 2     4 bytes C     R     W T     -     frequency	低
65 All:Frequency Threshold upper limit 2 4 bytes C R W T - frequency	低
	低
66 All:Frequency Threshold warning 2 1 bit C R - T - alarm	低
67 All:Frequency Threshold lower limit 3 4 bytes C R W T - frequency	低
68 All:Frequency Threshold upper limit 3 4 bytes C R W T - frequency	低
69 All:Frequency Threshold warning 3 1 bit C R - T - alarm	低
70 All:Frequency Threshold lower limit 4 4 bytes C R W T - frequency	低
71 All:Frequency Threshold upper limit 4 4 bytes C R W T - frequency	低
72 All:Frequency Threshold warning 4 1 bit C R - T - alarm	低
No. Name Function Flag Data Type	
59 All: Frequency Frequency C R T DPT14.033	
4 bytes	
This object is used for reporting frequency	
60 All: Frequency Request C.W DPT1.017	
60All: FrequencyRequestC WDPT1.0171 bit	
60     All: Frequency     Request     C W     DPT1.017       This object is used for requests for reporting frequency.	
60     All: Frequency     Request     C W     DPT1.017       1 bit       This object is used for requests for reporting frequency.       61,64,67     Threshold lower limit     O DWT	
60     All: Frequency     Request     C W     DPT1.017 1 bit       This object is used for requests for reporting frequency.     61,64,67 ,70     All: Frequency     Threshold lower limit 1/2/3/4     C R W T     DPT14.033 4 bytes	
60All: FrequencyRequestC WDPT1.017 1 bitThis object is used for requests for reporting frequency.01,64,67 1/2/3/4All: FrequencyDPT14.033 4 bytes62,65,68Threshold upper limit Threshold upper limitC R W TDPT14.033 4 bytes	
60All: FrequencyRequestC WDPT1.017 1 bit60All: FrequencyRequestC WDPT1.017 1 bitThis object is used for requests for reporting frequency.Threshold lower limit 1/2/3/4C R W TDPT14.033 4 bytes61,64,67 ,70All: FrequencyThreshold lower limit 1/2/3/4C R W TDPT14.033 4 bytes62,65,68 ,71All: FrequencyThreshold upper limit 1/2/3/4C R W TDPT14.033 4 bytes	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
60All: FrequencyRequestC WDPT1.017 1 bit70All: FrequencyThreshold lower limit 1/2/3/4C R W TDPT14.033 4 bytes62,65,68 7,71All: Frequency 1/2/3/4Threshold upper limit 1/2/3/4C R W TDPT14.033 4 bytes62,65,68 7,71All: Frequency 1/2/3/4Threshold upper limit 1/2/3/4DPT14.033 4 bytes62,65,68 7,71All: Frequency 1/2/3/4Threshold upper limit 1/2/3/4DPT14.033 4 bytes63,66,69Threshold warningDPT1.005	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
Init object to deed for requesting inequency.60All: FrequencyRequest $C W$ DPT1.017 1 bitThis object is used for requests for reporting frequency. $C W T$ DPT14.033 4 bytes61,64,67 ,70All: FrequencyThreshold lower limit 1/2/3/4 $C R W T$ DPT14.033 4 bytes62,65,68 ,71All: FrequencyThreshold upper limit 1/2/3/4 $C R W T$ DPT14.033 4 bytes62,65,68 ,71All: FrequencyThreshold upper limit 1/2/3/4 $C R W T$ DPT14.033 4 bytes63,66,69 ,72All: FrequencyThreshold warning 1/2/3/4 $C R T$ DPT1.005 1 bit63,66,69 ,72All: FrequencyThreshold warning 1/2/3/4 $C R T$ DPT1.005 1 bitThese objects are used for sending an alarm when current threshold is higher/lower than $C R T$ DPT1.005 1 bit	



## 5.2.6 Objects "All: Load control master"

Objects fu	unction status"All: Loa	nd control master"							
73	All:Load control master	Deactivate load control	1 bit C R	wт	-	enable	低		
74	All:Load control master	Load limit exceeded	1 bit C R	- т	-	alarm	低		
75	All:Load control master	Receive power value 1	4 bytes C -	wт	U	power (W)	低		
76	All:Load control master	Receive power value 2	4 bytes C -	wт	U	power (W)	低		
77	All:Load control master	Receive power value 3	4 bytes C -	wт	U	power (W)	低		
78	All:Load control master	Receive power value 4	4 bytes C -	wт	U	power (W)	低		
85	All:Load control master	Send sum power values	4 bytes C R	- т	-	power (W)	低		
86	All:Load control master	Send load cutdown stages	1 byte C R	- т	-		低		
87	All:Load control master	Receive/send load limit	4 bytes C R	ТW	-	power (W)	低		
88	All:Load control master	Status	4 bytes C R	- T	-	bit-combi	低		
No.	Name	Name Function Flag				Data Type			
73	All: Load control master	Deactivate load control	CRWT	DPT1.003 1 bit					
This obje	ct is used for deactiva	ating load control function.							
74	All: Load control	Load limit exceeded	CRT	DPT1.005					
master				1 Dit					
This obje	ct is used for indicatir	g whether load exceeds the	limit.	-					
75.04	All: Load control	Receive power value 1-		DPT14.056			56		
75-84	master 10 CWTU		CWIU		4 bytes				
These ob	jects are used for obt	aining the active power of sla	ave loads.						
				DPT14.056			6		
	All. Load control			4 hvtes					
85	master	Send sum power values	CRT						
	master				DP114.019				
						4 Dytes			
This obje	ct is used for requests	s for reporting the active pow	ver of slave loads.	_					
00	All: Load control	Send load cutdown			D	PT 236.0	01		
80	master	stages	GRI			1 byte			
This obje	ct is used for reporting	g load number to be unloade	d or loaded.						
	All: Load control	-				OPT14 05	56		
87	mactor	Receive/send load limit	CRWT						
	IIIdStel					4 Dytes			
This obje	ct is used for sending	or receiving load limit.							
0.0	All: Load control	Ctotus		DPT27.001			)1		
80	master	Status	GRI	1 byte					
This obie	t is used for indication	n load control status (invalid	for now)	1		2			
		ig iouu control status (invaliu	101 110 101.						



#### 5.2.7 Objects "All: Meter calc"

Objects function status"All: Meter calc"									
89 AI	l:Meter calc	Meter reading	4 bytes C R -	T - active ener低					
90 AI	l:Meter calc	Request	1 bit C - W	/ trigger 低					
91 AI	l:Meter calc	Receive meter value 1	4 bytes C - W	/ T U active ener低					
92 AI	l:Meter calc	Receive meter value 2	4 bytes C - W	/ T U active ener低					
93 AI	l:Meter calc	Receive meter value 3	4 bytes C - W	/ T U active ener低					
94 AI	l:Meter calc	Receive meter value 4	4 bytes C - W	/ T U active ener低					
95 AI	l:Meter calc	Receive meter value 5	4 bytes C - W	/ T U active ener低					
96 All:Meter calc		Receive meter value 6	4 bytes C - W	/ T U active ener低					
97 AI	l:Meter calc	Receive meter value 7	4 bytes C - W	/ T U active ener低					
98 AI	l:Meter calc	Receive meter value 8	4 bytes C - W	/ T U active ener低					
No.	Name	Function	Flag	Data Type					
80	All: Meter calc	Meter reading	CRT	DPT13.010					
09		Meter reading	UNI	4 bytes					
This object	t is used for reporting	g total meter calc.							
00	All: Motor colo	Dequest		DPT1.017					
90		Request	CW	1 bit					
This object is used for requests for reporting total meter calc.									
-		e let reperting tetal meter ea	10.						
01.08		Receive meter value 1.9		DPT13.010					
91-98	All: Meter calc	Receive meter value 1-8	CWTU	DPT13.010 4 bytes					

## 5.3 Objects "A/B/C"

## 5.3.1 Objects "A/B/C: Meter"

Objects function status"A/B/C: Meter"										
(Take circuit A as an example)										
99	A: Meter N	leter reading	4 bytes C R - T	- active ener低						
100	A: Meter R	equest	1 bit C - W -	- trigger 低						
No.	Name	Function	Flag	Data Type						
99,189,2	A/P/C: Motor	Motor roading	СРТ	DPT13.010						
79	A/B/C. Meter	Meter reading	CRI	4 bytes						
These obj	ects are used for re	oorting "A/B/C: meter".								
100,190,	A/P/C: Motor	Dequest	C M	DPT1.017						
280	AVD/C. Meter	Request		1 bit						
This objec	t is used for reques	ts for reporting "A/B/C: mete	er".							



## 5.3.2 Objects "A/B/C: Inter-meter"

Objects fun	ction status"A/B/C:	Inter-meter"				
(Take circu	uit A as an example)					
102 A:	Inter-meter	Meter reading	4 bytes C R -	T - active ener低		
103 A:	Inter-meter	Request	1 bit C - W	trigger 低		
104 A:	Inter-meter	Trigger 1 bit start	1 bit C R W	T - trigger 低		
105 A: Inter-meter		Change stop duration	2 bytes C R W	T - time (min) 低		
106 A:	Inter-meter	Warning	1 bit C R -	T - alarm 低		
107 A:	Inter-meter	Reset	1 bit C - W	reset 低		
108 A:	Inter-meter	Status	1bit C.R	I - state 1选		
No.	Name	Function	Flag	Data Type		
102,192,	02,192, A/B/C: Inter-		CRT	DPT13.010		
282	meter	Meter reading	UNI	1bit		
These obje	ects are used for rep	orting "A/B/C: inter-meter".				
103,193,	A/B/C: Inter-	Demuest	0.111	DPT1.017		
283	meter	Request	CW	1bit		
These obje	ects are used for req	uests for reporting "A/B/C: in	nter-meter".			
104,194,	A/B/C: Inter-			DPT1.017		
284	meter	Trigger 1 bit start	CRWT	1bit		
105 195				DPT1 017		
295	motor	Trigger 1 bit stop	CRWT	16it		
				TUIL		
These obje	ects are used for sta	rting/stopping inter-meter.				
104,194,		Change start time		DPT10.001		
284		Change start time		3 bytes		
				DPT10.001		
	A/B/C: Inter-	Change stop time		3 bytes		
105 195	meter		CRWI	DPT13 010		
285		Change stop limit		4 hytes		
200						
		Change stop duration		2 butos		
				2 Dytes		
These obje	ects are used for cha	anging "start time", "stop time	e", "stop limit" and "s	stop duration".		
106,196,		Warning	СРТ	DPT1.005		
286		warning	UNI	1 bit		
107,197,	A/B/C: Inter-		0.11	DPT1.015		
287	meter	Reset	CW	1 bit		
108,198				DPT1.010		
288		Status	CRT	1 hit		
Those shire	ate are used for sta	ning inter meter warning r	ocotting inter motor	and indicating inter		
		pping inter-meter warning, f	esetting inter-meter	and indicating inter-		
meter stati	us.					



## 5.3.3 Objects "A/B/C: Active power"

Objec	Objects function status"A/B/C: Active power"										
(Take	circuit A as an	example)									
109	A: Active power		Active power	4 bytes	С	R	-	Т	-	power (W)	低
110	A: Active power		Request	1 bit	С	-	W	-	-	trigger	低
111	A: Active power		Threshold lower limit 1	4 bytes	С	R	W	Т	-	power (W)	低
112	A: Active power		Threshold upper limit 1	4 bytes	С	R	W	т	-	power (W)	低
113	A: Active power		Threshold warning 1	1 bit	С	R	-	Т	-	alarm	低
114	A: Active power		Threshold lower limit 2	4 bytes	С	R	W	Т	-	power (W)	低
115	A: Active power		Threshold upper limit 2	4 bytes	С	R	W	Т	-	power (W)	低
116	A: Active power		Threshold warning 2	1 bit	С	R	-	Т	-	alarm	低
117	A: Active power		Threshold lower limit 3	4 bytes	С	R	W	Т	-	power (W)	低
118	A: Active power		Threshold upper limit 3	4 bytes	С	R	W	Т	-	power (W)	低
119	A: Active power		Threshold warning 3	1 bit	С	R	-	Т	-	alarm	低
120	A: Active power		Threshold lower limit 4	4 bytes	С	R	W	Т	-	power (W)	低
121	A: Active power		Threshold upper limit 4	4 bytes	С	R	W	Т	-	power (W)	低
122	A: Active power		Threshold warning 4	1 bit	С	R	-	Т	-	alarm	低
No. Name			Function				Flag	3		Data	Туре
10	A/B/C: Active				ОРТ					DPT1	4.056
10	9,199,289	power	Active power							4 by	/tes
These	e objects are us	ed for reporting c	ircuit active power.								
	-	A/B/C: Active								DPT1 017	
11	0,200,290		Request		CW				1	-:+	
		power								11	JIL
These	e objects are us	ed for requests for	or reporting circuit active	e power.							
111,*	114,117,120,										
201,2	204,207,210,		Threshold lower limit	1/2/3/4							
291.	294,297,300	A/B/C: Active								DPT1	4.056
112	115 118 121	nower				С	RV	VΤ	•	4 by	/tos
112,	110,110,121,	power	The second second second second	4/0/0/4						405	103
202,2	205,208,211,		I nresnoid upper limit	[ 1/2/3/4							
292,	295,298,301										
These	e objects are us	ed for setting the	upper/lower limit of "Th	reshold 1	/2/	3/4	"-				
113,	116,119,122,										
203 3	206 209 212	A/B/C: Active	Threshold warning	1/2/3/4		С	R	т		DP11	1.005
202	206 200 202	power		1 bit					oit		
293,296,299,302											
<b>T</b> 1.	200,200,002				ь. ·	. 1					
These	e objects are us	ed for sending ar	alarm when current th	reshold is	hię	ghe	er/lo	we	er t	han the	



## 5.3.4 Objects "A/B/C: Current"

Objects	s function statu	us"A/B/C: Current	,									
(Take (	circuit A as an	example)										
123	A: Current	Current		4 bytes	С	R	-	Т	-	electric cu	r低	
124	A: Current	Request		1 bit	С	-	W	-	-	trigger	低	
125	A: Current	Threshold lower	limit 1	4 bytes	С	R	W	Т	-	electric cu	r低	
126	A: Current	Threshold upper	per limit 1 4 bytes C R W T				Т	-	electric cu	r低		
127	A: Current	Threshold warning	ng1 1bit CR-T				Т	-	alarm	低		
128	A: Current	Threshold lower	limit 2	4 bytes	С	R	W	Т	-	electric cur低		
129	A: Current	Threshold upper	limit 2	4 bytes	С	R	W	Т	-	electric cu	r低	
130	A: Current	Threshold warnir	ng 2	1 bit	С	R	-	Т	-	alarm	低	
131	A: Current	Threshold lower	limit 3	4 bytes	С	R	W	Т	-	electric cu	r低	
132	A: Current	Threshold upper	limit 3	4 bytes	C	R	W	Т	-	electric cu	r低	
133	A: Current	Threshold warning	ng 3	1 bit	С	R	-	Т	-	alarm	低	
134	A: Current	Threshold lower	limit 4	4 bytes	С	R	W	Т	-	electric cu	r低	
135	A: Current	Threshold upper	limit 4	4 bytes	С	R	W	Т	-	electric cu	r低	
136	A: Current	Threshold warnir	ng 4	1 bit	С	R	-	Т	-	alarm	低	
	No.	Name		Function					[	Flag	Data	Туре
123	3 213 303	A/B/C: Current Curr		Current					C	RT	DPT1	4.019
120	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,									4 by	/tes	
This ol	bject is used f	or reporting curren	t.									
12/	1 214 204	A/D/C: Current	Degwaat			C W			DPT1	.017		
124	1,214,304	A/b/C. Current	Request				,	J VV	11	oit		
These	objects are us	sed for requests fo	r reporting	current.								
125,1	28,131,134,											
215,2	18,221,224,		Threshol	d lower limit	t 1/	2/3	/4					
305,3	08,311,314										DPT1	4.019
126,1	29,132,135,	A/B/C: Current							СІ	RWI	4 by	/tes
216.2	19.222.225.		Threshol	d upper limi	t 1/	2/3	/4				,	
306.3	09.312.315											
These	objects are u	sed for setting the	upper/lowe	er limit of "Th	nre	shc	ld 1	/2/	3/4	"		
127.1	30.133.136.	U	••									
217.2	20 223 226	A/B/C: Current	Thresho	old warning	1/2	/3/4	1		С	RT	DPT1	.005
307.3	10.313.316				• • •		•		0		11	oit
These	objects are us	Lend for sending an	alarm whe	en current th	res	sho	ld is	i s hio	ghe	er/lower th	an the	
upper/	lower limit.						-				-	
upper/	pper/lower limit.											



## 5.3.5 Objects "A/B/C: Voltage"

Objects	Objects function status"A/B/C: Voltage"											
(Take d	circuit A as an	example)										
137	A: Voltage	Voltage		4 bytes	С	R	-	Т	-	electric po	o 低	
138	A: Voltage	Request		1 bit	С	-	W	-	-	trigger	低	
139	A: Voltage	Threshold lower	limit 1	4 bytes	С	R	W	Т	-	electric po	o 低	
140	A: Voltage	Threshold upper	limit 1	4 bytes	С	R	W	Т	-	electric po	o 低	
141	A: Voltage	Threshold warning	ng 1	1 bit	C	R	-	Т	-	alarm	低	
142	A: Voltage	Threshold lower	limit 2	4 bytes	С	R	W	Т	-	electric po	o 低	
143	A: Voltage	Threshold upper	limit 2	4 bytes	С	R	W	Т	-	electric po	o 低	
144	A: Voltage	Threshold warning	ng 2	1 bit	С	R	-	Т	-	alarm	低	
145	A: Voltage	Threshold lower	limit 3	4 bytes	C	R	W	Т	-	electric po	o 低	
146	A: Voltage	Threshold upper	limit 3	4 bytes	С	R	W	Т	-	electric po	o 低	
147	A: Voltage	Threshold warning	ng 3	1 bit	С	R	-	Т	-	alarm	低	
148	A: Voltage	Threshold lower	limit 4	4 bytes	С	R	W	Т	-	electric po	o 低	
149	A: Voltage	Threshold upper	limit 4	4 bytes	C	R	W	Т	-	electric po	o 低	
150	A: Voltage	Threshold warning	ng 4	1 bit	С	R	-	Т	-	alarm	低	
	No.	Name		Function					F	lag	Data 1	уре
137	227 317	$\Delta/B/C$ : Voltage		Voltage					C	RТ	DPT14	.027
107	,227,317	Albio. Voltage		voltage					0		4 by	es
These	objects are us	sed for reporting ve	oltage.									
400	000.040										DPT1	.017
138	5,228,318	A/B/C: Voltage		Request					C	S VV	1 b	it
These	objects are us	sed for requests fo	r reporting v	oltage.							I	
139,14	42,145,148,											
229.2	32.235.238.		Threshold	lower limit	1/:	2/3/	/4					
319.3	22 325 328						-				DPT14	027
140 1	43 146 149	A/B/C: Current							CF	R W T	4 hv	
230.2	33 236 230		Threshold	upper limit	- 1/	2/2	14				- U y	.00
230,2	00,200,209,		THESHOL		. 17.	2/3	/4					
320,323,326,329												
141,144,147,150,									DPT1	.005		
231,2	231,234,237,240 A/B/C: Current Threshold warning 1/2/3/4					1		С	RT	1 b	it	
321,3	321,324,327,330											
These	objects are us	sed for sending an	alarm when	o current th	res	hol	d is	hię	ghe	r/lower th	nan the	
upper/	lower limit.											



#### 5.3.6 Objects "A/B/C: Apparent Power/Power Factor"

Objects function	on status"A/B/C: App	irent Power/Power Fa	ctor"					
(Take circuit A	as an example)							
151 A: Ap	parent power Appare	t power	4 bytes	C R	- T - po	wer(W) 低		
152 A: Apparent power Request			1 bit	с -	W trig	iger 低		
153 A: Po	wer factor Power f	actor	4 bytes	C R	- T - po	wer fact 低		
154 A: Po	wer factor Reques		1 bit	с -	W trig	iger 低		
No.	Name	Functior	ı		Flag	Data Type		
151 041 221	A/B/C: Apparent	Apparant D	owor		СРТ	DPT14.056		
151,241,331	Power	Apparent Po	Jwei		GRI	4 bytes		
These objects	are used for reportin	g apparent power.						
150 040 220	A/B/C: Apparent	Doguoo	Deguest		C W	DPT1.017		
152,242,552	Power	Reques	Request		0 11	1 bit		
These objects	are used for request	s for reporting appare	ent power.					
152 040 000			to a			DPT14.057		
153,243,333	A/B/C: Power Facto	Power Fac	ctor		GRI	4 bytes		
These objects	are used for reportin	g power factor.						
154,244,334 A/B/C: Power Factor Request C W DPT1.017								
These objects	are used for request	for reporting power	factor.	•				

## 5.3.7 Object "A/B/C: Load control slave"

Objects functio	Objects function status"A/B/C: Load control slave"									
155 A: Lo	155 A: Load control slave Deactivate load control 1 bit C R W enable 低									
156 A: Load control slave Load cutdown stage output 1 byte C R W T - counter										
No. Name Function Flag Data Type										
155 245 225	A/B/C: Load	Deactivate lead control		DPT1.003						
155,245,555	control slave			1 bit						
These objects	are used for dea	activating load control functi	on.							
156 246 226	A/B/C: Load	Load cutdown stage	СРМТ	DPT5.010						
150,240,550	156,246,336   C R W I     control slave   output     1 byte									
These objects	are used for circ	cuit A/B/C to accept "load cu	itdown stage".							



#### 5.3.8 Object "A/B/C: Switch Actuator"

Objects functio	Objects function status"A/B/C: Switch Actuator"										
(Take circuit A as an example)											
157 A: Switch actuator Output(0=OFF,1=ON) 1 bit C R W T - open/close 低											
158 A: Sw	158 A: Switch actuator Status 1 bit C R - T - open/close 低										
No. Name Function Flag Data Type											
157 047 227	A/B/C: Switch	Output (0=OFF, 1=ON)	=ON)		DPT1.009						
157,247,337	actuator	Output (1=OFF, 0=ON)	CRWI		1 bit			1 bit			
These objects	are used for con	trolling relay output.									
150 240 220	A/B/C: Switch	Status			۰ N	,			DPT1.009		
150,240,550	158,248,338StatusC R Wactuator1 bit										
These objects	are used for indi	cating relay status.									

## 5.3.9 Object "A/B/C: Monitor Current"

Objects functio	Objects function status"A/B/C: Monitor Current"										
(Take circuit A as an example)											
159 A: Monitor current YES-1,NO-0 1 bit C R - T - alarm 低											
No. Name Function Flag Data Type											
	A/B/C:										
159,249,339	Monitor	YES-1, NO-0	CRT	DPTT.005							
current 1 bit											
These objects	are used for mo	nitoring whether there is cu	rrent in the circuit.								

## 5.3.10 Object "A/B/C: Flashing"

Objects function status"A/B/C: Flashing"										
(Take circuit A as an example)										
160 A: Flashing Switch 1 bit C R W open/close 低										
No. Name Function Flag Data Type										
No.	Name	Function	Flag	Data Type						
No.	Name A/B/C:	Function	Flag	Data Type DPT1.009						
<b>No.</b> 160,250,340	Name A/B/C: Flashing	Function Switch	Flag C R W	Data Type DPT1.009 1 bit						



#### 5.3.11 Object "A/B/C: Staircase lighting"

Objects functio	Objects function status"A/B/C: Staircase lighting"										
(Take circuit A	as an example)										
161 A: Sta	aircase lighting Switch		1 bit	С	R	W	-	-	switch	低	
162 A: Staircase lighting Change time 2 bytes C R W T - time (s) 化低											
163 A: Sta	aircase lighting Alarm		1 bit	С	R	-	Т	-	alarm	低	
No.	Name	Function		F	ag			Data Type			
161 051 041	A/B/C: Staircase	Quritab			א ר	,			DPT1.001		
101,251,341	lighting	Switch	CRW					1 bit			
These objects	are used for turning or	n/off staircase lights.									
160 050 040	A/B/C: Staircase	Change time		חי	14/	т			DPT	7.005	
102,252,542	lighting	Change line		л ,	vv	I			2 b	ytes	
These objects	are used for changing	the duration of stairc	ase ligl	hts							
162 252 242	A/B/C: Staircase	Alorm		0	пт				DPT	1.005	
103,253,343	163,253,343AlarmC R Tlighting1 bit										
These objects	are used for sending a	in alarm when the sta	aircase	ligl	nts	of c	ircu	uit A	A/B/C are	on.	

#### 5.3.12 Object "A/B/C: Scenes"

Objects functio	Objects function status"A/B/C: Scenes"									
(Take circuit A as an example)										
164 A: Scenes Scenes(1-64) 1 byte C R W T - scene cont化										
No. Name Function Flag Data Type										
No.	Name	Function	Flag	Data Type						
No.	Name	Function	Flag	Data Type DPT18.001						
<b>No.</b> 164,254,344	Name A/B/C: Scenes	Function Scenes (1-64)	Flag C R W T	Data Type DPT18.001 1 byte						

## 5.3.13 Object "A/B/C: Forced operation"

Objects function	Objects function status"A/B/C: Forced operation"										
(Take circuit A as an example)											
167 A: Forced operation Forced operation(1 bit) 1 bit C - W enable 低											
168 A: Fo	168 A: Forced operation Status(1 bit) 1 bit C R - T - enable 低										
No.	Name	Function		Flag	Data Type						
	A/P/C: Forod	Ecroped operation (1 bit)			DPT1.003						
167,257,347 A/B/C: Forced				CW	1 bit						
	operation Forced operation (2 bit) DPT2.001										

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				2 bits							
These objects	These objects are used for circuit A/B/C to start or stop the forced operation.										
	DPT1.003										
160 250 240	A/B/C: Forced	Status (T bit)	ОРТ	1 bit							
100,200,340	operation	Statua (2 bit)	CRI	DPT2.001							
		Status (2 bit)		2 bits							
These objects	are used for indic	ating the forced operation	status of circuit A/B/	/C.							

## 5.3.14 Object "A/B/C: Energy saving"

Objects	s function statu	us"A/B	S/C: Energy saving"											
169	A: Energy sa	ving	Switch object 1		1 bit	С	-	-	т	-	switc	h	低	
170	A: Energy sa	ving	Value object 1		1 byte	С	-	-	т	-	perce	entag	低	
171	A: Energy sa	ving	Dimming object 1		4 bit	С	-	-	Т	-	dimn	ning c	低	
172	A: Energy sa	ving	Scene object 1		1 byte	С	-	-	Т	-	scene	e cont	低	
173	A: Energy sa	ving	Temperature 1		2 bytes	С	-	-	Т	-	temp	eratu	低	
174	A: Energy sa	ving	Switch object 2		1 bit	С	-	-	Т	-	swite	h	低	
175	A: Energy sa	ving	Value object 2		1 byte	С	-	-	Т	-	perce	entag	低	
176	A: Energy sa	ving	Dimming object 2		4 bit	С	-	-	Т	-	dimn	ning c	低	
177	A: Energy sa	ving	Scene object 2		1 byte	С	-	-	Т	-	scene	e cont	低	
178	A: Energy sa	ving	Temperature 2		2 bytes	С	-	-	Т	-	temp	eratu	低	
179	A: Energy sa	ving	Switch object 3		1 bit	С	-	-	Т	-	swite	h	低	
180	A: Energy sa	ving	Value object 3		1 byte	С	-	-	Т	-	perce	entag	低	
181	A: Energy sa	ving	Dimming object 3		4 bit	С	-	-	Т	-	dimn	ning c	低	
182	A: Energy sa	ving	Scene object 3		1 byte	С	-	-	Т	-	scene	e cont	低	
183	A: Energy sa	ving	Temperature 3		2 bytes	С	-	-	Т	-	temp	eratu	低	
184	A: Energy sa	ving	Switch object 4		1 bit	С	-	-	Т	-	switc	h	低	
185	A: Energy sa	ving	Value object 4		1 byte	С	-	-	Т	-	perce	entag	低	
186	A: Energy sa	ving	Dimming object 4		4 bit	С	-	-	Т	-	dimn	ning c	低	
187	A: Energy sa	ving	Scene object 4		1 byte	С	-	-	Т	-	scene	e cont	.低	
188	A: Energy sa	ving	Temperature 4		2 bytes	С	-	-	Т	-	temp	eratu	低	
	No.		Name		Functio	on				Fla	ag	Da	ata Typ	e
169,1	74,179,184,											וח		11
259,20	64,269,274,	A/B	/C: Energy saving	Switc	h objec <sup>.</sup>	t 1/	2/3	/4		С	Т	וט	1 54	
349,3	54,359,364												T DIL	
When	circuit A/B/C r	neets e	nergy-saving function	, these c	objects	will	be	ser	nt b	y th	ie set	value	<b>.</b>	
170,1	75,180,185,													
260,20	260.265.270.275, A/B/C: Energy saving			Value	e object	1/2	2/3/	4		С	Т	DF	15.00	JI
350.3	55,360,365		0, 0		•								1 byte	
When	When circuit A/B/C meets energy-saving function, these objects will be sent by the set value, range													
from 0	to 255			.,	5.2,0010			- 0	2.16	~,			,	
10110	10 200.													

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171,176,181,186, 261,266,271,276, 351,356,361,366	A/B/C: Energy saving	B/C: Energy saving Dimming object 1/2/3/4							
When circuit A/B/C meets energy-saving function, these objects will be sent by the set va									
100%-Down 100%).									
172,177,182,187, 262,267,272,277, 352,357,362,367	A/B/C: Energy saving	Scene object 1/2/3/4	СТ	DPT18.001 1 byte					
When circuit A/B/C n	neets energy-saving function	, these objects will be sen	t by the set	value, range					
from 0 to 63.									
173,178,183,188, 263,268,273,278, 353,358,363,368	A/B/C: Energy saving	Temperature 1/2/3/4	СТ	DPT9.001 2 bytes DPT9.027 2 bytes					
When circuit A/B/C meets energy-saving function, these objects will be sent by the set value, range from 0 to 255 Celsius/Eabrenheit									



## 6 Data Downloading

#### 6.1 Interface Setting

when downloading data to energy actuator, KNX interface is necessary.

After connecting KNX interface to a computer via USB, click "Bus" in the main page of ETS, "HDL USB Interface" will show up in "Discovered Interfaces". Double click to add devices and the interface will show up in "Current Interface", as shown in Figure 6-1.



Figure 6-1 Interface setting

## 6.2 Data Downloading

Right click on the database to be downloaded to the energy actuator and select "Download".



Turn on the programming mode of energy actuator and the red LED will be kept on. As shown in Figure 6-2, it shows the data has been downloaded on the right side of ETS.

Close Proj	ect 🥜 Undo 🥖	🔪 Redo 🛛 🚔 Reports 📄	Workplace 🔻 📋	📃 Catalogs 🛛 🖉	Diagnost	ics	
Close Proj pology Add Channel 2 11 2 12 2 13 2 14	Name External temperature General General General	Redo Reports	Vorkplace     Search     Length     C     R     W     2 bytes     C     -     W     2 bytes     C     -     W     2 bytes     C     -     W	V T U Data Type T U T - T - T - T - T -	Diagnost     Diagnost     Diagnost     Cov     Low     Low     Low     Low	<ul> <li>Properties</li> <li>Find and Re</li> <li>Workspaces</li> <li>Todo Items</li> <li>Pending Op Active</li> <li>Clear History</li> </ul>	place erations History
						<ul> <li>Download</li> </ul>	All): Finished

Figure 6-2 Download data