



DPMP-GUI

1/16Brick DC-DC Power module KD series (Full digital) GUI for PMBusTM control User's manual

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DPMP-GUI

PMBus control GUI Manual

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DPMP-GUI

PMBus control GUI Manual

1. Product overview

This product is a GUI for the PC to control 1/16Brick DC-DC power module of KD series via a PMBusTM

interface.

The loaded functions are shown below.

- Detect the connected modules
- Write/Read of various settings
- Monitor the status of voltages, current, temperature etc.
- Monitor or clear the fault alarm status of voltages, current, temperature etc.
- Write data to nonvolatile memories or copy the data from nonvolatile memories to the operating storage area.
- Reset to the factory (default) settings.
- Polling function which is use to periodically monitor status, voltages, current and temperature of the power module.

KD series is compliant with PMBusTM1.2 specification, detailed settings of voltages, current, temperature etc. and a monitoring function are available. Please refer to PMBus_Specification published by the System Management Interface Forum for further details (Some commands are not supported)

2. Installation

a. Operation environment

This software is only tested for operation with 32 bits OS of Windows XP/Vista/7. So please used a PC with the supported OS (Note that the 64 bits version is not supported), and also Microsoft .NET Framework4.0 or about is required.

b. Installation

Execute setup.exe and the following screen will be shown automatically. Click Next \downarrow



Figure 1 Installer





Click Install button \downarrow

leady to Install the Prog	ram
The wizard is ready to begin	n installation.
If you want to review or cha exit the wizard.	ange any of your installation settings, click Back. Click Cancel to
Current Settings:	
Setup Type:	
Typical	
Destination Folder:	
C:¥Program Files¥FDK (CORPORATION¥KD Series Software¥
User Information:	
Name: y-ueno	
Company: FDK	
J	

Figure 2 Install execution

After finishing the installation, "Launch DpmPmbusWindow.exe" will be shown on the start menu, and the following icon will be displayed on the desktop.



Figure 3 GUI icon

c. Installation of the USB driver

The USB driver should be installed before using the GUI. To install, USB-PMBus communication interface adaptor (hereinafter referred to as UPIA) should be connected with the PC. The driver install screen will be started up, and select the following location to install the USB driver.

"C:¥Program Files¥FDK CORPORATION¥KD Series Software¥Drivers"





3. Startup of GUI and the detection of connected module

Select "Launch DpmPmbusWindow.exe" on the Start menu to startup the GUI. Below is the full view of the

GUI.

KD SERIES DPM USB TO PMBus INTERI	FACE GUI VER. 1.00									1000	
odule 12H									_	_	
MODULE	SETTINGS								DK	<	
MODEL FPKD48T6R016PA	MODULE ON/OFF RM	MT OFF .	PGO	OD OFF	ŧ.	2.	400 V	DICITAL PO	WER MODULE	PMPar	CIII
REVISION 00	VIN, TURN ON	34.500 V	VOL	JT DRO	OP		$0\mathrm{mV/A}$	DIGITALTO	WER MODULI	. I MIDUS	GUI
SELECT 💟	VIN, TURN OFF	32.500 V	VOL	JT ON D	DELAY		10 ms	SEND COMMAND / D.	ATALOG	LL SEND	CLEA
READ VALUES	VOUT SET	6.000 V	VOL	JT OFF I	DELAY		0 ms				
INPUT VOLTAGE 46.87	5 V VOUT TRIM	0.000 V	vot	JT RISE	TIME		15 ms				
OUTPUT VOLTAGE 6.01	PGOOD ON 8 V	2.700 V	vot	JT FALL	TIME		$^{5}\mathrm{ms}$				
OUTPUT CURRENT 0.00	0 A WARN/FAULT LIMITS										
TEMPERATURE 3	1 °C VIN OV FAULT	103.000 V	VOU	TOVW	ARN	7.	350 V				
PEAD STATUS	VIN OV WARN	78.000 V	VOU	T UV F	AULT	2.	100 V	RECEIVE DATA / STAT	US LOG		CLEA
VIN OV WARN/FAULT	VIN UV WARN	33.625 V	VOU	T UV W	ARN	2.	700 V				
VIN UV WARN/FAULT	VOUT MAX	8.742 V	IOUT	OC FA	ULT	20.	A 000				
ON/PGOOD	VOUT MARGIN HIGH	6.300 V	IOUT	COC WA	ARN	16.	750 A				
VOLT UV WARN/FAULT	VOUT MARGIN LOW	5.700 V	OTF	AULT			125 °C				
VOUT OV WARN/FAULT	VOUT OV FAULT	8.741 V	OT V	VARN			115 °C				
VOUT MAX WARN	OPTION AND RESPO	NSE						NOL EL E	. H. H.	8	
VOUT TON MAX FAULT	ON/OFF OPTIONS	1 •	1 •	1	• 1	+ 0	•	MODULE 5	0 17 18	ALL	NOT
VOUT TOFF MAX WARN	MARGIN OPTIONS	MARG	IN OFF				•	DOLUDIC DATE 20			
IOUT OC WARN/FAULT	VIN OV FAULT RESP	11		111	•	000	•	POLLING KAIE 20.	• ms	3040	ALLERI
IOUT SHARE FAULT	VOUT OV FAULT RESP	10	+	111	•	000	*	WRITE SETTINGS	GET STATUS	CLEAR	R FAULTS
OT WARN/FAULT	VOUT UV FAULT RESP	10		111	-	000	•			_	
UT WARN/FAULT	IOUT OC FAULT RESP	11	-	111	•	000	•	READ SETTINGS	STORE USER	RESTO	ARE USEI
CMD/DATA/PEC/OTHER	OT FAULT RESP	11	-	111	•	000	•	SEEK MODULES	RESTOR	E DEFAULTS	

Figure 4 Full view of the GUI

In order to recognize the connected modules, please make sure that the PC, the UPIA and the power module are properly connected. The "*MODULE*" column on the GUI will display every connected modules.

MODULE	
MODEL	FPKD48T6R016PA
REVISION	00
SELECT	V

Figure 5 Detection of KD series

Please confirm the modules recognition is right. And, the tab windows on the GUI will increase in response to the number of power modules are being detected. Also, the startup of the GUI without connected to any module should click the SEEK_MODULE to detect connected power modules.

WRITE SETTINGS	GET STATUS	CLEAR FAULTS					
READ SETTINGS	STORE USER	RESTORE USER					
SEEK MODULES	RESTORE DEFAULTS						

Figure 6 SEEK button





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4. Operating instructions

Details of the GUI functions are described as below. Operation must be under the condition of the GUI acknowledged the power module.

a. ON/OFF of the KD series

ON/OFF control is available from the GUI, by select of the pull-down menu "SETTINGS"_MODULE ON/OFF_o There are 2 types of ON/OFF control, which are RMT control and CMD control. The RMT control is a DC level control directly from the UPIA, and the CMD control is controlling by a host controller via PMBus interface.

SETTINGS			
MODULE ON/OFF	RMT OFF 🔹	PGOOD OFF	2.400 V
VIN, TURN ON	34.500 V	VOUT DROOP	$0 \mathrm{mV/A}$
VIN, TURN OFF	32.500 V	VOUT ON DELAY	10 ms
VOUT SET	6.000 V	VOUT OFF DELAY	0 ms
VOUT TRIM	0.000 V	VOUT RISE TIME	15 ms
PGOOD ON	2.700 V	VOUT FALL TIME	$5\mathrm{ms}$



CMD_OFF/ON is available under the RMT_ON condition. The CMD_ON will be disabled when off condition cause by RMT_OFF.

If the devise is off even though under the CMD_ON condition, turn RMT_ON \rightarrow CMD_OFF \rightarrow CMD_ON and then reconfirm the operation condition is good.

b. Read of the setting values

Click the **READ_SETTINGS** button that the PC able to monitor the connected KD series setting values.

WRITE SETTINGS	GET STATUS	CLEAR FAULTS				
READ SETTINGS	STORE USER	RESTORE USER				
SEEK MODULES	RESTORE DEFAULTS					

Figure 8 READ/WRITE/STATUS

c. Write of the setting value

The settings will be changed by clicking **WRITE_SETTINGS**. Overwrite the values on the GUI after the execution of **READ_SETTINGS** (available frame: "*SETTINGS*", "*WARN/FAULT LIMIT*", "*OPTION AND RESPONSE*") and then click **WRITE_SETTINGS** on the GUI, you can write and change the settings of the connected KD series for required specification.





d. Monitoring functions

By clicking **GET_STATUS** button can read the conditions of input voltage, output voltage, output current, and temperature of the KD series and the values will be displayed in the "*READ_VALUES*" frame.

READ VALUES	
INPUT VOLTAGE	46.875 V
OUTPUT VOLTAGE	6.018 V
OUTPUT CURRENT	0.000 A
TEMPERATURE	31 °C

Figure 9 VALUES

By checking (✓) POLL check box, the read status and read values frames will be updated on the period set by the POLLING_RATE (POLL is the execution of GET_STATUS periodically)

e. Read and clear the status of fault alarms etc..

By clicking **GET_STATUS** button can also read various status of fault alarm of the KD series and the values will be displayed in the "*READ_STATUS*" frame. Green box represent error free and if the fault occurred it turns red. E.g. VIN OV WARN/FAULT have 2 boxes which represent Warning/Fault condition.



Figure 10 STATUS and CLEAR

When any of the fault alarm occurred, "*SMBALART*" box will be turned red, after confirming the cause of the fault status alarm, and by clicking **CLEAR_FAULTS** button fault status alarm can be cleared.

By checking (✓) POLL check box, the read status and read values frames will be updated on the period set by the POLLING_RATE (POLL is the execution of GET_STATUS periodically).





f. Settings of ON_OFF_CONFIG, fault response

The five LSB bits of the PMBus interface ON_OFF_CONFIG(02h) command can be set from the **ON/OFF_OPTIONS** on the "*OPTION AND RESPONSE*" frame.

OPTION AND RESPONSE											
ON/OFF OPTIONS	1	•	1	•	1	•	1	•	0	•)
MARGIN OPTIONS	M	ARG	IN O	FF						•	
VIN OV FAULT RESP	11		٠		111		•	00	0	٠	
VOUT OV FAULT RESP	10		٠		111		٠	00	0	٠	
VOUT UV FAULT RESP	10		·		111		•	00	0	٠	
IOUT OC FAULT RESP	11		·		111		•	00	D	•	
OT FAULT RESP	11		•		111		•	00	0	•	

Figure 11 ON_OFF_CONFIG

Output Margin-H/L, stop can be selected. (PMBus: OPERATION (01h)[5:4])

OPTION AND RESPONSE											
ON/OFF OPTIONS	1	-	1	•	1	•	1	•	0	•	
MARGIN OPTIONS	M	ARGI	NO	FF						•	\mathbf{D}
VIN OV FAULT RESP	11		٠		111		•	00	0	٠	
VOUT OV FAULT RESP	10		٠		111		•	00	0	٠	
VOUT UV FAULT RESP	10		•		111		•	00	0	٠	
IOUT OC FAULT RESP	11		•		111		•	00	0	٠	
OT FAULT RESP	11		•		111		•	00	0	٠	



Settings of fault responses (Immediate shuts down, continue operation, Hiccup etc.) of fault conditions are

available. The way of settings is to select through the separated column in

"*OPTION AND RESPONSE*" frame. Pull-down menu from left RSP: shuts down or continue etc. basic settings, RS: restart settings, DT: delay time settings are available.

Detailed operation of the settings please refer to the KD series specification.

OPTION AND RESPONSE						
ON/OFF OPTIONS	1 -	1	- 1	- 1	- 0	•
MARGIN OPTIONS	MARG	IN O	FF			-
VIN OV FAULT RESP	11	•	111	•	000	•
VOUT OV FAULT RESP	10	•	111	•	000	•
VOUT UV FAULT RESP	10	-	111	•	000	•
IOUT OC FAULT RESP	11	-	111	-	000	•
OT FAULT RESP	11	·	111	•	000	•

Figure 13 Fault response





g. Settings value and store/restore of the non-volatile memory

The KD series has built-in a non-volatile memory and be able to store the setting values of the operating memory in used. On the other hand, stored data also can be moved to the operating memory. With these functions, set condition which has been changed during the evaluation can be saved. Call out the saved settings soon after power on can save time to set up again. Furthermore, Initialize to the factory (default) settings can easily be done too.

Setting data can be store to non-volatile memory by using the **STORE_USER** command. On the other hand, a click of **RESTORE_USER** enable the data on non-volatile memory copy to operating memory for use. If you like to reset to factory (default) settings just click **RESTORE_DEFAULTS** button.

h. Settings etc. via command line

Read/Write settings via the command line is also available. It can be used to set/get multiple commands at a time. Below is an example (% is a command prompt which is not a user input)

- % 03 w :Send byte: Send byte 03h
 (Send byte is the write process without any write data)
- % 01 w 80 :Write byte: Write data 80h with command 01h (Write byte is the write process with a data byte)
- % 35 w 34.625 :Write word: Write 34.625[V] with command 35h (Voltages threshold setting unit is [V])
- % 46 w 12.25 :Write word: Write 12.25[A] with command 46h (Currents threshold setting unit is [A])
- % 53 w 90 :Write word: Write $90[^{\circ}C]$ with command 53h

(Temperatures threshold setting unit is [°C], after the decimal point is disapprove and "—" is available)

- % 01 r : Read word: Read data from with command 01h (Use for Word read)
- %9A w fpkd48t01208Pa

:Write block: Write fpkd48t01208Pa to the address 9Ah

(Use for Block write)

• % 9A r :Read block: Read data from with command 9Ah (Use for Block read)

Prepare a set of multiple settings in a test file, copy them and paste it into the command window, the required commands can be set. Please reconfirmed the settings by clicking **READ_SETTINGS** button.





5. Precaution

a. Settings does not reflect.

If the write settings values is over the maximum settings value, the settings value will be ignored. So please reconfirm the settings.

6. Exception clause

The adaptor, software driver and software tools are developed only to evaluated digital brick power module. The software tools may periodical be updated and in some situation it may not be the latest version. FDK does not guarantee the accuracy and safety of any information and also FDK does not take any responsibility for any damages resulting from the use of this product and software tools.