FIMER

Solar Inverter
PVI-PMU

Quick Installation Guide

1. Funcionalities

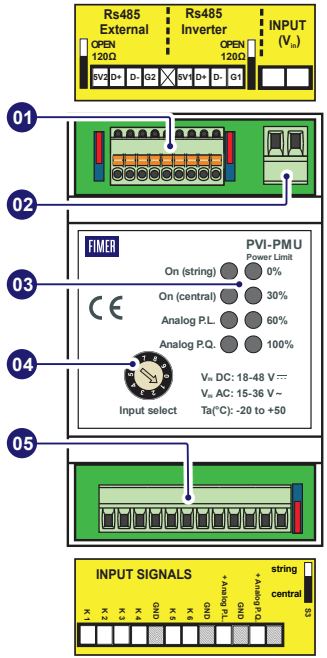
EN

The PVI-PMU allow the possibility to manage the active power limitation, the reactive power and power factor control.
Digital and analogue input levels translates into corresponding control commands according to the German Renewable Energy Sources Act (EEG).

NOTE – Inverter receiving the specific ripple control signal provides the corrisponding active and/or reactive power command.

2. Main components

Main components	
01	RS-485 connector
02	Power supply connector
03	LEDs
04	Rotary switch
05	Inputs connector (digital and analogic)



3. LED status description

○ = Off
● = On
◑ = Blink
⊗ = Active

4. Interconnection Table

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Rotary switch position	Position switch s3	Input	Operation	LEDs
0	String	**K1,K2,K3,K4** (Table 1)	PL RELE'	
1	String	**I1** (Graph 1)	PL ANALOG	
2	String	**K1,K2,K3,K4** (Table 1) **I2** (Graph 2)	PL RELE' and PQ ANALOG [1] (Mode 1)	
3	String	**I1** (Graph 1) **I2** (Graph 2)	PL ANALOG and PQ ANALOG [1] (Mode 1)	
4	String	**K1,K2,K3,K4** (Table 1) **I2** (Graph 2)	PL RELE' and PQ ANALOG [1] (Mode 4)	
5	String	**I1** (Graph 1) **I2** (Graph 2)	PL ANALOG and PQ ANALOG [1] (Mode 4)	
7	String	**K1,K2,K3,K4** (Table 2) **I2** (Graph 2)	Approval Test PL RELE' and PQ ANALOG [1] (Mode 1)	
8	String	**I1** (Graph 1) **I2** (Graph 2)	Approval Test PL ANALOG and PQ ANALOG [1] (Mode 1)	
0	Central	**K1,K2,K3,K4** (Table 1)	PL RELE'	
1	Central	**I1** (Graph 1)	PL ANALOG	
2	Central	**K1,K2,K3,K4** (Table 1) **I2** (Graph 2)	PL RELE' and PQ ANALOG [1] (Mode 1)	
3	Central	**I1** (Graph 1) **I2** (Graph 2)	PL ANALOG and PQ ANALOG [1] (Mode 1)	
4	Central	**K1,K2,K3,K4** (Table 1) **I2** (Graph 2)	PL RELE' and PQ ANALOG [1] (Mode 4)	
5	Central	**I1** (Graph 1) **I2** (Graph 2)	PL ANALOG and PQ ANALOG [1] (Mode 4)	
7	Central	**K1,K2,K3,K4** (Table 2) **I2** (Graph 2)	Approval Test PL RELE' and PQ ANALOG [1] (Mode 1)	
8	Central	**I1** (Graph 1) **I2** (Graph 2)	Approval Test PL ANALOG and PQ ANALOG [1] (Mode 1)	
6	Central or String	**I2** (Graph 3)	PQ ANALOG [1] (Mode 7)	
9	Central or String		RESERVED BOOT LOADER	

1) Reactive Power Control:
MODE 1. Cos(phi) fixed with respect to Pn=Inverter rated Power (see Graph 2)
MODE 4. Cos(phi) fixed with respect to P(t) =Inverter real time Output Power (see Graph 2)
MODE 7. Tan(phi) fixed with respect to P(t) = Inverter real time Output Power (see Graph 3)

5. Technical Data

EN

Parameter	Limits	Note
AC Input Voltage Range [Vac]	15-36 (nom. 24V)	
AC Input Frequency Range	50/60 Hz	
DC Input Voltage Range [Vdc]	18-48 (nom. 24 V)	
Power Consumption	<10 W	
Operating working Temperature	-20 to +60 °C	
Operating humidity (RH%, @40°C)	25% to 95%	
Weight (PMU only)	180 g	
IP Protection degree	IP 20	
Dimension WxHxD	53x90x57 mm	
Case material		Polycarbonate
Number of input	6	Switch input
Rating Voltage	15 V	
Rating Current	50 mA	
Isolation	100 Vdc	Input to Serial Port
I1 = Input Analog P.L. (4 to 20mA)	22 mA	Configure with select rotary switch
I2 = Input Analog P.Q.(4 to 20mA)	22 mA	Configure with select rotary switch
Isolation	100 Vdc	Analog input to Serial port

6. Power Limitation Commands

Table 1

PL (%)	Rele'	Status
100	K1	CLOSED
60	K2	CLOSED
30	K3	CLOSED
0 (*)	K4	CLOSED

Table 2

PL (%)	K1	K2	K3	K4
100	OPEN	CLOSED	OPEN	CLOSED
90	CLOSED	OPEN	OPEN	CLOSED
80	OPEN	OPEN	OPEN	CLOSED
70	CLOSED	CLOSED	CLOSED	OPEN
60	OPEN	CLOSED	CLOSED	OPEN
50	CLOSED	OPEN	CLOSED	OPEN
40	OPEN	OPEN	CLOSED	OPEN
30	CLOSED	CLOSED	OPEN	OPEN
20	OPEN	CLOSED	OPEN	OPEN
15	CLOSED	OPEN	OPEN	OPEN
0 [1)]	CLOSED	CLOSED	OPEN	CLOSED
No Command	OPEN	OPEN	OPEN	OPEN

1) When switch S3 is in position “CENTRAL” the command value is 2.5% (value within standard tolerances)

1. Funktion

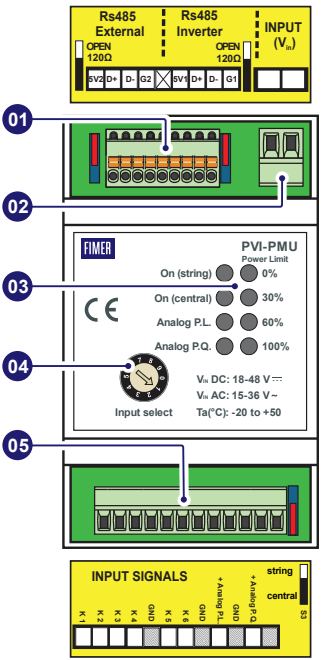
DE

Der PVI-PMU erlaubt die Verwaltung von Wirkleistungsbegrenzung, Blindleistung und Leistungsfaktorsteuerung.
Digitale und analoge Eingangsstufen übersetzen gemäß dem deutschen Erneuerbaren-Energien-Gesetz (EEG) in entsprechende Steuerbefehle.

NOTE – Der Wechselrichter, der das spezifische Rundsteuersignal empfängt, sendet den entsprechenden Wirk- und/oder Blindleistungsbefehl.

2. Hauptkomponenten

Hauptkomponenten	
01	RS-485-Anschluss
02	Stromversorgungsanschluss
03	LEDs
04	Drehschalter
05	Eingangsanschluss (digital und analog)



3. LED-Statusbeschreibung

○ = An
● = Aus
◑ = Blinkt
⊗ = Active

4. Schaltungstabelle

DE

Position drehschalter	Position schalter s3	Eingang	Betrieb	LEDs [2]
0	String	**K1,K2,K3,K4** (Tabelle 1)	LB RELE'	
1	String	**I1** (Diagramm 1)	LB ANALOG	
2	String	**K1,K2,K3,K4** (Tabelle 1) **I2** (Diagramm 2)	LB RELE' und BL ANALOG [1] (Modus 1)	
3	String	**I1** (Diagramm 1) **I2** (Diagramm 2)	LB ANALOG und BL ANALOG [1] (Modus 1)	
4	String	**K1,K2,K3,K4** (Tabelle 1) **I2** (Diagramm 2)	LB RELE' und BL ANALOG [1] (Modus 4)	
5	String	**I1** (Diagramm 1) **I2** (Diagramm 2)	LB ANALOG und BL ANALOG [1] (Modus 4)	
7	String	**K1,K2,K3,K4** (Tabelle 2) **I2** (Diagramm 2)	Zulassungsprüfung LB RELE' und BL ANALOG [1] (Modus 1)	
8	String	**I1** (Diagramm 1) **I2** (Diagramm 2)	Zulassungsprüfung LB ANALOG und BL ANALOG [1] (Modus 1)	
0	Central	**K1,K2,K3,K4** (Tabelle 1)	LB RELE'	
1	Central	**I1** (Diagramm 1)	LB ANALOG	
2	Central	**K1,K2,K3,K4** (Tabelle 1) **I2** (Diagramm 2)	LB RELE' und BL ANALOG [1] (Modus 1)	
3	Central	**I1** (Diagramm 1) **I2** (Diagramm 2)	LB ANALOG und BL ANALOG [1] (Modus 1)	
4	Central	**K1,K2,K3,K4** (Tabelle 1) **I2** (Diagramm 2)	LB RELE' und BL ANALOG [1] (Modus 4)	
5	Central	**I1** (Diagramm 1) **I2** (Diagramm 2)	LB ANALOG und BL ANALOG [1] (Modus 4)	
7	Central	**K1,K2,K3,K4** (Tabelle 2) **I2** (Diagramm 2)	Zulassungsprüfung LB RELE' and BL ANALOG [1] (Modus 1)	
8	Central	**I1** (Diagramm 1) **I2** (Diagramm 2)	Zulassungsprüfung LB ANALOG und BL ANALOG [1] (Modus 1)	
6	Central oder String	**I2** (Diagramm 3)	BL ANALOG [1] (Modus 7)	
9	Central oder String		RESERVIERTER BOOTLOADER	

1) Blindleistungssteuerung:
MODUS 1. Cos(phi) fest in Bezug auf Pn=Auf den Wechselrichter bezogene Leistung (siehe Diagramm 2)
MODUS 4. Cos(phi) fest in Bezug auf P(t) = Echtzeit-Ausgangsleistung des Wechselrichters (siehe Diagramm 2)
MODUS 7. Tan(phi) fest in Bezug auf P(t) = Echtzeit-Ausgangsleistung des Wechselrichters (siehe Diagramm 3)

5. Technische Daten

DE

Parameter	Grenzwerte	Hinweis
AC-Eingangsspannungsbereich [Vac]	15-36 (nom. 24 V)	
AC-Eingangsfrequenzbereich	50/60 Hz	
DC-Eingangsspannungsbereich [Vdc]	18-48 (nom. 24 V)	
Leistungsaufnahme	< 10 W	
Betriebstemperatur:	-20 bis +60 °C	
Betriebsfeuchte (RF %, @ 40 °C)	25 % bis 95 %	
Gewicht (nur PMU)	180 g	
IP-Schutzklasse	IP 20	
Abmessung B x H x L	53 x 90 x 57 mm	
Gehäusematerial		Polykarbonat
Anzahl der Eingänge	6	Schaltereingang
Bemessungsspannung	15 V	
Bemessungsstrom	50 mA	
Isolierung	100 Vdc	Eingang zum seriellen Anschluss
I1 = Eingang Analog LB (4 bis 20 mA)	22 mA	Mit dem Auswahldrehschalter zu konfigurieren
I2 = Eingang Analog BL (4 bis 20 mA)	22 mA	Mit dem Auswahldrehschalter zu konfigurieren
Isolierung	100 Vdc	Analogeingang zum seriellen Anschluss

6. Befehle für die Leistungsbegrenzung

Tabelle 1

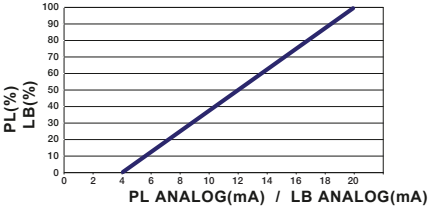
LB (%)	Rele'	Status
100	K1	GESCHLOSSEN
60	K2	GESCHLOSSEN
30	K3	GESCHLOSSEN
0 (*)	K4	GESCHLOSSEN

Tabelle 2

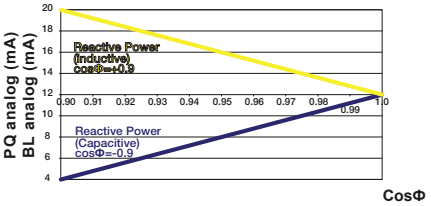
PL (%)	K1	K2	K3	K4
100	OFFEN	GESCHLOSSEN	OFFEN	GESCHLOSSEN
90	CLOSED	OFFEN	OFFEN	GESCHLOSSEN
80	GESCHLOSSEN	OFFEN	OFFEN	GESCHLOSSEN
70	GESCHLOSSEN	GESCHLOSSEN	GESCHLOSSEN	OFFEN
60	OFFEN	GESCHLOSSEN	GESCHLOSSEN	OFFEN
50	GESCHLOSSEN	OFFEN	GESCHLOSSEN	OFFEN
40	OFFEN	OFFEN	GESCHLOSSEN	OFFEN
30	GESCHLOSSEN	GESCHLOSSEN	OFFEN	OFFEN
20	OFFEN	GESCHLOSSEN	OFFEN	OFFEN
15	GESCHLOSSEN	OFFEN	OFFEN	OFFEN
0 [1)]	GESCHLOSSEN	GESCHLOSSEN	OFFEN	GESCHLOSSEN
Kein Befehl	OFFEN	OFFEN	OFFEN	OFFEN

1) Wenn sich Schalter S3 in Position „CENTRAL“ befindet, ist der Befehlswert 2,5 % (Wert innerhalb der Standardtoleranzen)

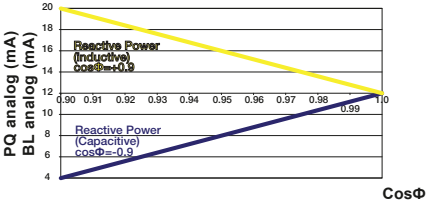
Graph 1: PL= f (+Analog P.L.) / Diagramm 1: LB=f (+Analog LB)



Graph 2: cosΦ= f (+Analog P.Q.) / Diagramm 2: cosΦ= f (+Analog BL)



Graph 3: tanΦf (+Analog P.Q.) / Diagramm 3: tanΦf (+Analog BL)



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