



GPS-Blinker product image

Feature summary

- GPS Synchronized Blinking
- Supports complex blinking patterns
 - up to 4 ontimes
 - up to 4 offtimes
- Compatible with DIG-CCCV-15W Power Supply
- When no GPS-Antenna is connect, it works non-synchronized.
- Internal GPS amplifier

Product description

The GPS-Blinker primary purpose is to synchronize the blinking of lights and other loads in complex blinking patterns, leveraging an external power supply. It has the capability to synchronize multiple power supplies, with the DPS programmable power supply DIG-CCCV-15 being a compatible option. The device is equipped with a GPS amplifier to ensure optimal reception.

The GPS-Blinker receives timing information through the GPS antenna. In cases where no GPS antenna is connected, the device operates in an arbitrary mode. The GPS-Blinker supports **complex blinking** patterns with up to 4 ontimes and 4 offtimes. By default, the blink sequence is set to an on-time of 0.2 seconds followed by an off-time of 0.8 seconds, resulting in a blink period of 1 second.

Specification overview

Description	Value
Input	
Input Voltage	230 V _{ac}
Input Frequency	49 - 61 Hz
Control Output	
Default Ontime	0.2 s
Default Offtime	0.8 s
Control Drive Strength	0.1A
Protection	
Input Fuse	yes
Short circuit protection	yes
Mechanical	
Dimensions (mm)	36 x 90 x 58

Ordering information

Ordercode	Description
GPS-Blinker	GPS Blinker with default 0.2 s on / 0.8 s off
Other options available. Contact DPS.	

Engineering standards

Applied engineering standards	
IEC 61558-2-6	IEC 62368-1
IEC 61010-1	IEC 61010-2-201
IEC 61558-2-6	



1 Functional description

1.1 Overview (Reproduced)

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1.2 Ultra Long Life Device

This device harnesses the cutting-edge technology of Digital Power Systems Ultra Long Life Series, which has been proven to endure over 60 years of continuous operation during rigorous accelerated lifetime tests.

1.3 Blinking Sequence

The device comes preconfigured with a blinking pattern characterized by a 0.2-second duration of being on, followed by a 0.8-second duration of being off, resulting in a total cycle period of 1 second.

1.4 Protections

The following output protections are in place:

- **Input Fuse** on input side.
- **Metal Oxide Varistor** on input side.
- **Low Voltage resettable fuse at trigger pin:** If the output of the trigger pin sees too much current an internal resettable fuse is activated. The fuse ratings are depicted in the specification table.



2 Pinout

The pinout of the GPS-Blinker is depicted in Figure 1.

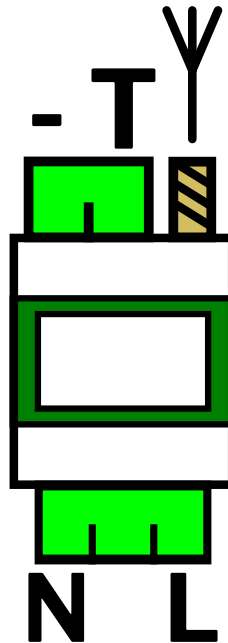


Figure 1: Connection diagram GPS-Blinker.

Pin	Functional description
Input	
N	Neutral (Grid)
L	Conductor (Grid)
GPS Antenne	
GPS	SMA Connector for 50 Ω SMA Cable
Control input	
G	Circuit GND
T	PPS Ausgang - Short circuit





3 Specification

The specification is shown in the following table. If not otherwise specified the following parameters have been used: $T_{amb}=25^{\circ}\text{C}$.

	Min	Typ	Max	Unit
Primärseite Primary Side				
Eingangsspannung Input Voltage	200	230	250	$V_{ac,rms}$
Eingangsfrequenz Input Frequency	49	50	61	Hz
Leistungsfaktor Power factor	0	0.4	1	
Anzahl AC Phasen Number of AC Phases	1	1	1	
AC Sicherung AC Fuse	yes			
Sicherungsproductnummer Fuse Partnumber	2410-0750TS			
Trigger Secondary Side				
Galvanische Isolierung Trigger Signal zu Netz Galvanic isolation tigger side to grid	yes / ja			
Schaltspannung Switching Voltage			30	V_{dc}
Schaltstrom Switching Current			0.1	A_{dc}
Schalter Switch	Mosfet			
Trigger Rücksetzbare Sicherung Trigger Resettable Fuse	nSMD005			
Steckverbinder Connectors				
Wechselstrom Steckverbinder AC Input Connector	3 polig, Pitch 5.08mm			
Trigger Steckverbinder Trigger Output	2 polig, Pitch 5.08mm			
UART Steckverbinder Uart Connector	JST-PH 4 Poles			





GPS-Blinker

Programmable GPS Synchronized Blinker

	Min	Typ	Max	Unit
GPS Antenne				
GPS Antenna				
Externe Antenne External Antenna Connector		SMA		
Unterstützung aktive Antenne Aktive Antenna supported		yes		
Externe Antenne im Lieferumfang External Antenna within delivery		Nein		
Empfohlene Antenne Recommended Antenna		u-blox ANN-MS-0-005		
Standardmäßige Bootzeit Bootime		60	600	sec
Betriebsmodi				
Operating mode				
Standardmäßige Anzeit Default ontime		0.1		sec
Standardmäßige Außzeit Default offtime		0.9		sec
Maximale Anzeit max ontime		60		sec
Bedingung Blinkperiode 1 Blink Periode Condition 1	Periode must be a full second			
Bedingung Blinkperiode 1 Blink Periode Condition 1	60 seconds must be divideable by periode.			
Programmierung				
Programming				
Programmierschnittschnelle Programming Interface	MCU Tracer (PC Software)			
Programmierwerkzeug Programming Tool	Isolated USB/UART Adapter			
Gehäuse				
Case				
Montageform Mounting Type	Din RAIL			
Breite Width	38 (3 Units)			mm
Teilungseinheiten (Breite) Seperation Units (Width)	3			Units
Höhe Height	58			mm





GPS-Blinker

Programmable GPS Synchronized Blinker

	Min	Typ	Max	Unit
Sicherheitsfeatures Safety Features				
Kurzschlusschutz Trigger Short circuit protection		yes		
Leerlaufschutz Trigger Open circuit protection		yes (by design)		
Schutzlackierung Conformal coating		no		
Transientenschutz Transient protection		Metal oxyde varistor		
Betriebsbedingungen Operating Conditions				
Temperaturbereich Temperature Range	-20		40	°C
Technische Merkmale Technical Characteristics				
Elektrolytkondensatoren Electrolytic Capacitors		No electrolytic capacitors used		



4 Programming instructions

The GPS-Blinker blink pattern can be programmed. The programming is done over the UART interface. A UART interface may be used for programming **and** monitoring of the UART interface. When programming, the user voids the GPS-Blinker's warranty.

4.1 UART-Converter

For the conversion a UART Cable is required. An isolated cable and AC power supply is required. The configuration specified in the following table must be used. The operation mode (GPS Monitoring or UART Programming) depends on the used cable. If a crossover cable is used, it's monitoring the GPS module. If a non-crossover cable is used, the programming option is active.

Definition Crossover Cable: A crossover cable is a cable where TX and RX pins are swapped. Hence, the original TX pin is connected to RX and RX is connected to the TX pin.

Parameter	Setting
Cable	
PC Isolation of the cable	recommended
Type of Cable	JST-PH-4
Cable for Programming	Standard (non-crossover)
UART Configuration	
Boud-Rate	9600 Boud
Parity	none
Data-Bits	8
Stop-Bits	1

4.2 Programming

Programming must be done via a UART-Console. The following codes are supported.

Code	Verbal description
Abstract description	
\$BLKST,[o1],[f1]	Set the ontime to [o1] msec, and offtime to [f1] msec.
\$BLKST,[o1],[f1],[o2],[f2]	Set the first ontime to [o1] msec, and offtime to [f1] msec. Then the second ontime is executed [o2], followed by the offtime [f2].
\$BLKST,[o1],[f1],[o2],[f2],[o3],[f3]	3 on and offtimes, specified in msec. Analog to previous description.
\$BLKST,[o1],[f1],[o2],[f2],[o3],[f3],[o4],[f4]	4 on and offtimes, specified in msec. Analog to previous description.





The following examples show examples of typical blink sequences.

Code	Verbal description
Examples	
\$BLKST,200,800	200 msec, 800 msec off.
\$BLKST,200,100,200,500	200 msec on, 100 msec off, 200 msec on, 500 msec off.
\$BLKST,200,100,200,100,200,200	200 msec on, 100 msec off, 200 msec on, 100 msec off, 200 msec on, 200 msec off
\$BLKST,200,100,200,100,200,100,200,1900	200 msec on, 100 msec off, 200 msec on, 100 msec off, 200 msec on, 200 msec off, equals to morsing 'H'
\$BLKST,1000,500,1000,1500	1000 msec on, 500 msec off. 1000 msec on, 1500 msec off-

4.3 Programming Workflow

4.3.1 Identify UART Interface

Go to device manager (e.g. Windows Device Manager) and identify the comport.

4.3.2 Connect via Terminal

If not installed, download a terminal console like hterm. Connect via the terminal console to the device. Make sure the correct programming cable and baud rate is used.

4.3.3 Program

Enter the required programming sequence.

4.4 Debugging

The GPS receiver can be debugged by using an crossover UART Cable.

4.5 LEDs

Green LED: The green led can be used to verify operation of the device. The Green LED is on, when the power supply is enabled, and off when the power supply is disabled.

Red LED: The red LED is toggled when a PPS (pulse-per-second) signal from the GPS Module is received. If the LED is permanently on or off, the GPS reception is faulted.



5 Measurements

5.1 Measurement Conditions

All measurements were made at room temperature. The input was set to $230V_{ac,rms}$.

5.2 GPS Timing

5.2.1 Turnon

A reference GPS Signal (top) was measured against the trigger output (bottom) during turnon, as shown in Figure 2.

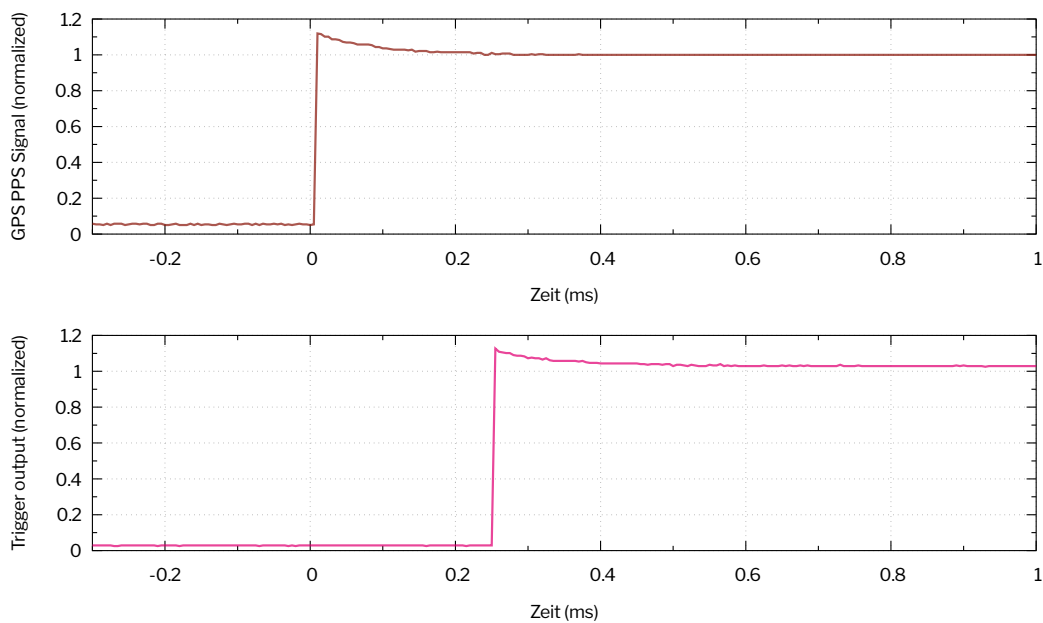


Figure 2: The GPS on-delay was measured against the GPS PPS reference signal.



5.2.2 Turnoff

A reference GPS Signal (top) was measured against the trigger output (bottom) during turoff, as shown in Figure 3.

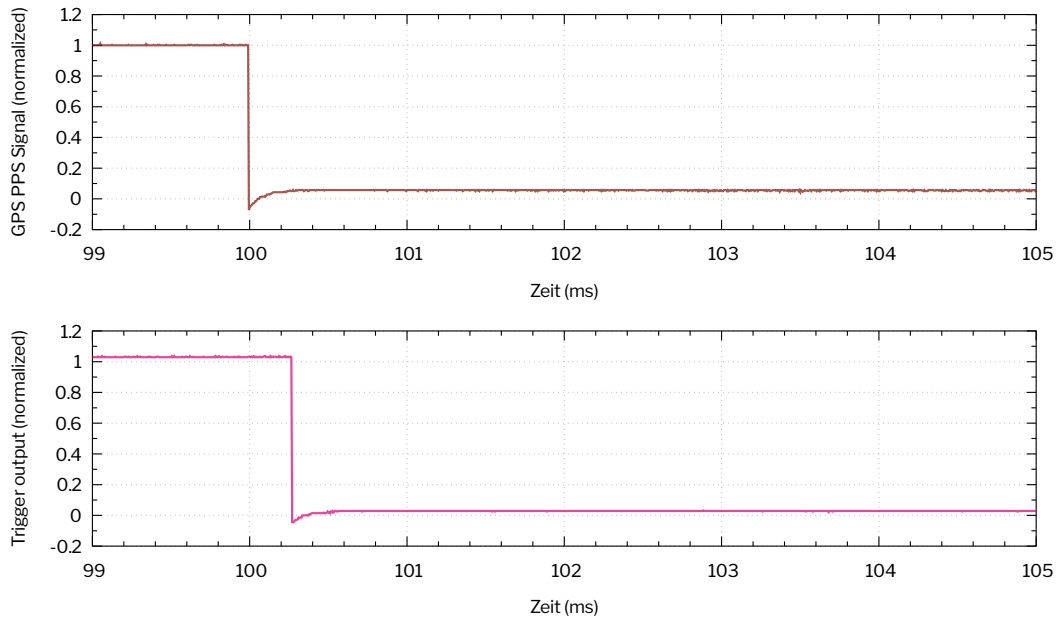


Figure 3: The GPS off-delay was measured against the GPS PPS reference signal.



5.3 EMC

The conducted EMC emissions were measured against the reference standard in Figure 4. Voltage average and Quasi Peak emissions were measured.

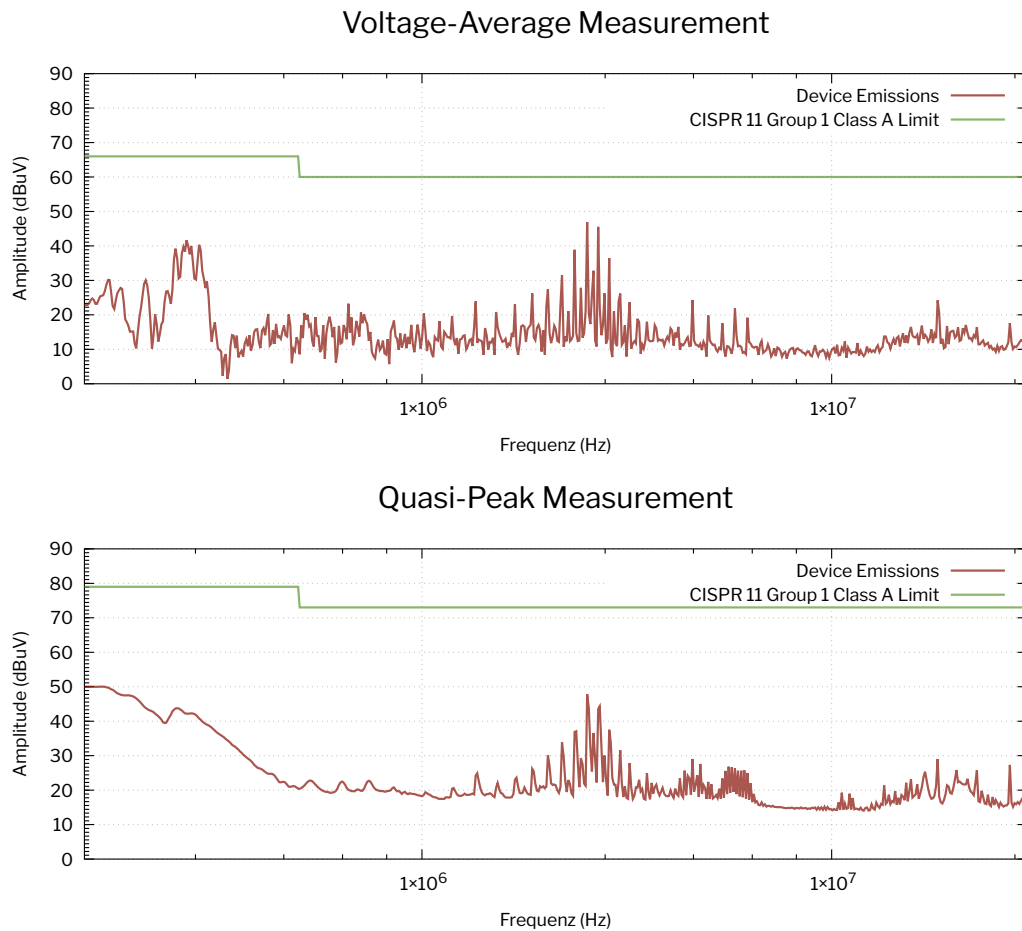


Figure 4: GPS-Blinker EMC conducted emissions against reference standard.



6 Case

The case drawing GPS-Blinker is shown in Figure 5.

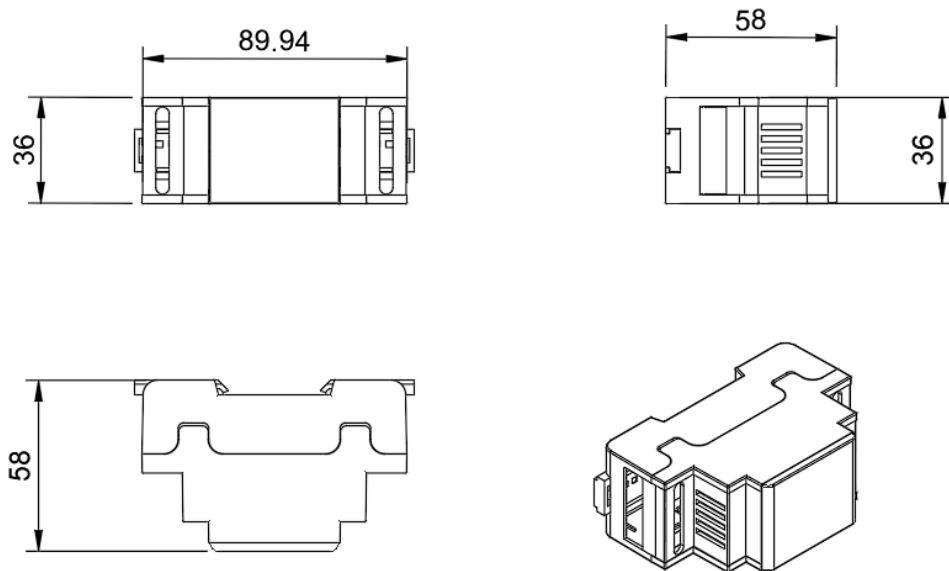


Figure 5: Bare Product drawing.

7 Product label

The Label for the GPS-Blinker 7 is depicted in the following Figure 6.



Figure 6: The product label GPS-Blinker.





7.1 Datasheet Quality

Digital Power Systems aims for the highest datasheet quality. We value your feedback to improve this document. Please email:

`datasheet (ät) digitalpowersystems (döt) eu`

7.2 Revision History

The revision history is depicted in the following table.

Date	Changes in Revision
24.8.2023	Initial release
1.9.2023	Extended Programming Examples
19.9.2023	Default Blink Frequency changed from 0.1s / 0.9s to 0.2s / 0.8s

7.3 Contact Information

This is a product of the Digital Power Systems GmbH (DPS).

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