Datasheet

PWM LEVEL CONVERTER A3120

Reference: PWM-DB15-BNC-A3120-V1.0

1. General Description

The **PWM Level Converter** is a compact electronic module designed for the conversion and galvanic isolation of PWM signals from $3.3\,\text{V}$ / $5\,\text{V}$ logic levels to a $15\,\text{V}$ output level. Based on the **A3120 opto-driver**, it ensures fast, reliable, and clean switching for driving power stages.

This module is ideally suited for interfacing control platforms such as **Arduino, DSP, dSPACE, FPGA** with power devices including **MOSFETs** and **IGBTs**.

Figure 1: PWM Level Converter module overview

2. Electrical Specifications

Parameter	Symbol	Value	Unit
Logic input voltage	V_{in}	3.3 – 5	V
Supply voltage	V_{CC}	15 – 30	V
Peak output current (max)	$I_{out,peak}$	2.5	A
Supply current	I_{CC}	≤ 5	mA
Common-mode rejection	CMR	≥ 25	kV/μs
Common-mode voltage	V_{CM}	1500	V
Maximum switching time	t_{sw}	≤ 500	ns
Undervoltage protection	UVLO	Integrated	–
Operating temperature	T_{op}	-40 to +85	°C

3. Functional Description

The module relies on optical transmission of the PWM signal between the logic side and the power side.

- **Input**: Low-voltage PWM signal

- **Isolation**: High-speed HCPL3120 optocoupler

- **Output**: Isolated and level-shifted PWM signal up to 30 V

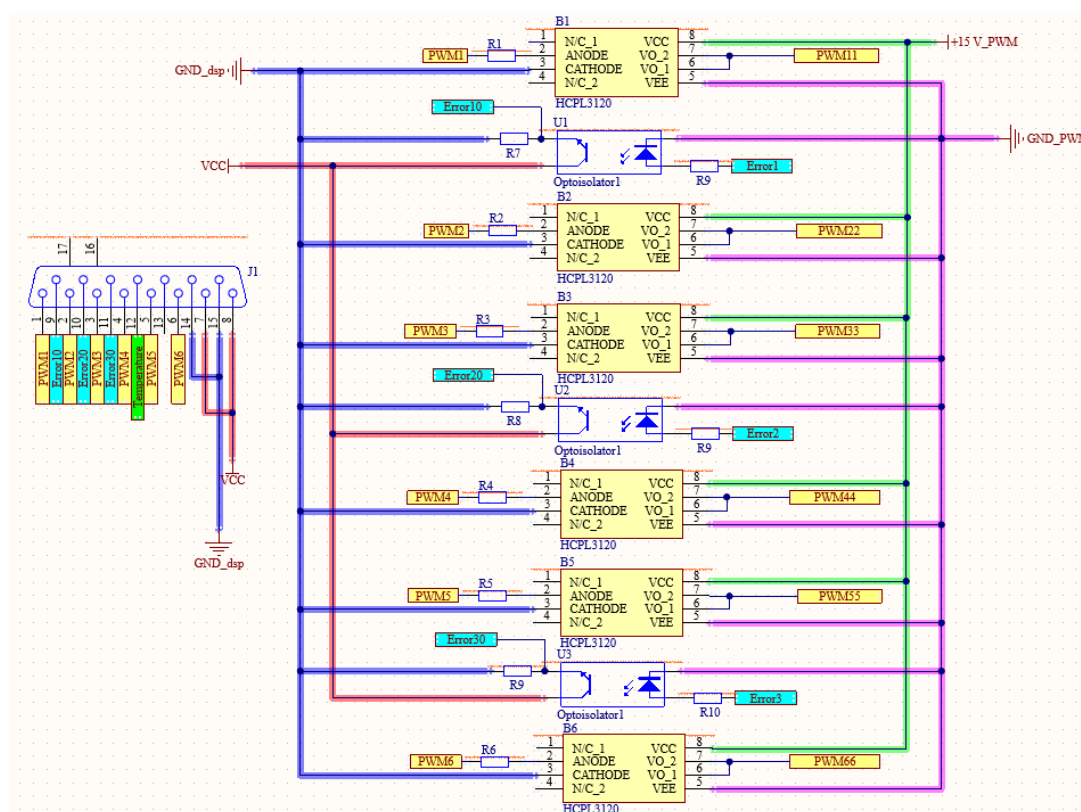This architecture ensures excellent protection of the control electronics and high immunity to electrical noise.

Figure 2: Photo of the PWM Level Converter module

4. Pin Configuration

Pin	Name	Description
1	PWM_x	PWM input (VCC = 3.3 V / 5 V)
2	GND_DSP	Logic ground
3	+15V_PWM	15 V output supply
4	PWM_xx	Isolated PWM output
5	GND_PWM	Power ground

5. Application Example: Semikron-Type Three-Phase Inverter

5.1. Context

Industrial three-phase inverters (SEMIKRON: SEMIKUBE, SKiiP, SEMITRANS) require:

- A 15 V gate drive voltage

- Robust galvanic isolation

- High immunity to fast dv/dt transients

The **A3120 PWM Level Converter 15V** fully meets these requirements.
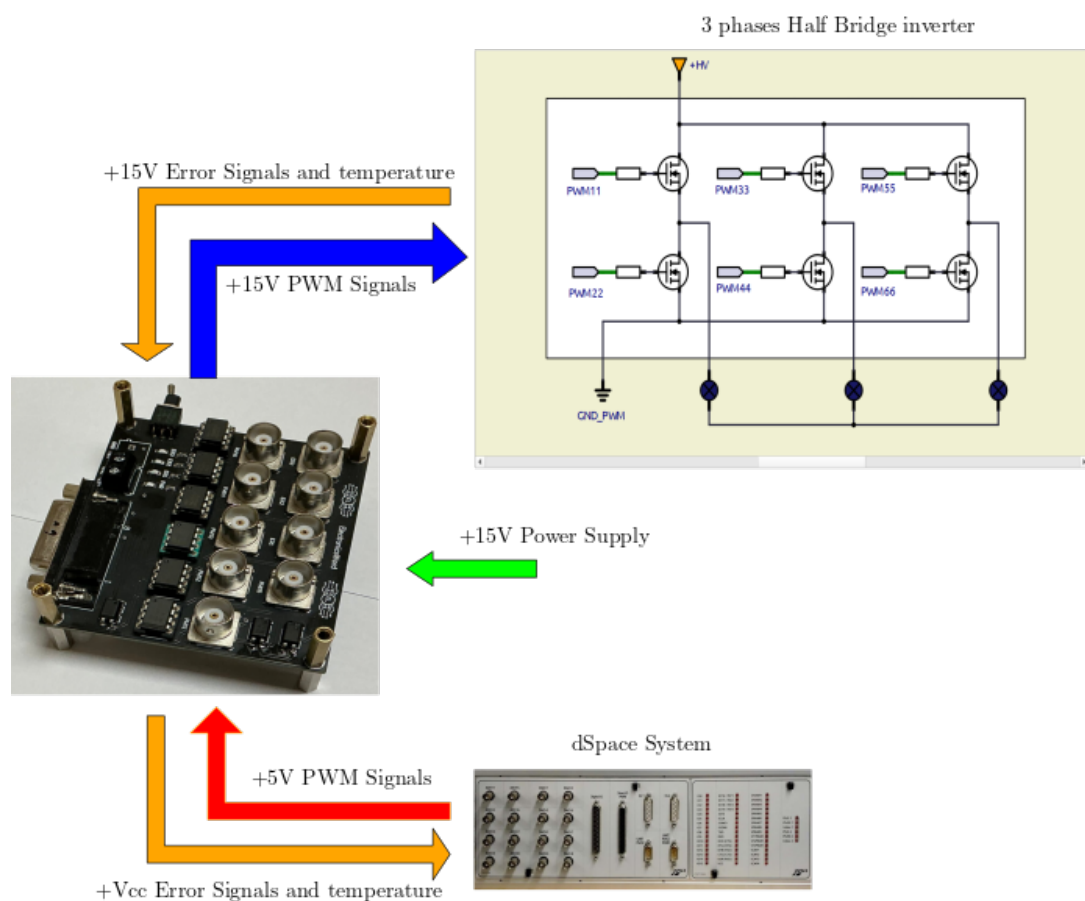
5.2. Simplified Principle Diagram

Figure 3: Example of PWM Level Converter usage

6. Key Advantages

- Reinforced galvanic isolation

- Excellent switching performance

- Modular and scalable architecture

- Ideal for educational and research applications

7. Ordering Information

Reference	Description
PWM-DB15-BNC-A3120	Isolated PWM level converter 3.3–5 V → 15 V

8. Warnings

- Do not exceed the specified maximum voltages

- Ensure proper decoupling of the 15 V power supply

- Maximum channel current depends on the BNC connector rating

9. Contact

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