

Decoder: Miningen Light 2

Miningen Light 2 ist DER Decoder auf unserer [Modellbahn-Anlage.de](https://wiki.modellbahn-anlage.de/). Er soll die Verbindung zwischen DCC-Zentralen und Hardware sein.

Ein- und Ausgänge des Decoders

```

////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
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//
// DARSTELLUNG DES DECODERS, SEINER EIN- UND AUSGÄNGE
//
//
//   PC6          REST          RESET-o|1          28|o-Druckknopf/I/O 7 analog
5   PC5
//   PD0          digital 0 (RX)    I/O 3-o|2          27|o-I/O 6          analog
4   PC4
//   PD1          digital 1 (TX)    I/O 5-o|3          26|o-DKnopf LED          analog
3   PC3
//   PD2          digital 2          DCC IN-o|4          25|o-I/O 2          analog
2   PC2
//   PD3          digital 3 ~        WS2812B-o|5          24|o-I/O 1          analog
1   PC1
//   PD4          digital 4          BOARD LED-o|6          23|o-I/O 4          analog
0   PC0
//
//          VCC-o|7          22|o-GND
//          GND-o|8          21|o-AREF
//   PB6          CLOCK-o|9          20|o-VCC
//   PB7          CLOCK-o|10         19|o-LED5
digital 13       PB5
//   PD5          digital 5 ~        LED1-o|11          18|o-LED4
digital 12       PB4
//   PD6          digital 6 ~        LED3-o|12          17|o-LED6          ~
digital 11       PB3
//   PD7          digital 7          LED2-o|13          16|o-LED7          ~
digital 10       PB2
//   PB0          digital 8          Relais-o|14_____15|o-Servo/LED8          ~
digital 9        PB1
//

// Define Pins
#define IO3 0
#define IO5 1
#define DCC 2

```

```
#define WS2812B 3
#define BOARD_LED 4
#define LED1 5
#define LED3 6
#define LED2 7
#define Relais 8
#define Servo 9      #(oder LED8)
#define LED7 10
#define LED6 11
#define LED4 12
#define LED5 13

void setup()
{
  pinMode(RED, OUTPUT);
  pinMode(GREEN, OUTPUT);
  pinMode(BLUE, OUTPUT);
  digitalWrite(RED, HIGH);
  digitalWrite(GREEN, LOW);
  digitalWrite(BLUE, LOW);
}
```

LED per DCC ein- und ausschalten

```
#include <NmraDcc.h>

NmraDcc Dcc;
const int ledPin = 13;
const int dccPin = 2; // DCC-Eingang

void setup() {
  pinMode(ledPin, OUTPUT);
  Dcc.pin(dccPin, 0); // DCC-Eingang initialisieren
  Dcc.begin();        // DCC-Decoder starten
}

void loop() {
  Dcc.process();      // DCC-Befehle verarbeiten
}

// Diese Funktion wird aufgerufen, wenn ein DCC-Befehl für diese Adresse
// kommt
void notifyDccAccTurnout(uint16_t addr, uint8_t direction, uint8_t
outputPower) {
  if (addr == 1) { // Adresse 1
    if (direction == 1) {
      digitalWrite(ledPin, HIGH);
    }
  }
}
```

```
    } else {  
        digitalWrite(ledPin, LOW);  
    }  
}  
}
```

LED faden mit DCC

```
const int dccInputPin = 2; // Eingang vom DCC-Decoder  
const int ledPin = 9;      // LED-Pin (muss PWM-fähig sein: 3, 5, 6, 9, 10, 11)  
  
int brightness = 0;  
int fadeAmount = 5; // Schrittweite für das Faden  
bool fadeIn = true; // Richtung: ein- oder ausfaden  
  
void setup() {  
    pinMode(dccInputPin, INPUT);  
    pinMode(ledPin, OUTPUT);  
}  
  
void loop() {  
    if (digitalRead(dccInputPin) == HIGH) {  
        // LED langsam ein- und ausfaden  
        analogWrite(ledPin, brightness);  
        brightness = brightness + fadeAmount;  
  
        if (brightness <= 0 || brightness >= 255) {  
            fadeAmount = -fadeAmount; // Richtung umkehren  
        }  
        delay(30); // Verzögerung für sanftes Faden  
    } else {  
        analogWrite(ledPin, 0); // LED aus  
        brightness = 0;  
    }  
}
```

LED schaltet hier sofort aus, wenn der DCC Befehl kommt

```
const int dccInputPin = 2; // Eingang vom DCC-Decoder  
const int ledPin = 9;      // LED-Pin (PWM-fähig: 3, 5, 6, 9, 10, 11)  
  
int brightness = 0;  
int fadeAmount = 5;  
bool fadeIn = true;  
  
void setup() {
```

```
pinMode(dccInputPin, INPUT);
pinMode(ledPin, OUTPUT);
}

void loop() {
  if (digitalRead(dccInputPin) == HIGH) {
    // LED langsam ein- und ausfaden
    analogWrite(ledPin, brightness);
    brightness = brightness + fadeAmount;

    if (brightness <= 0 || brightness >= 255) {
      fadeAmount = -fadeAmount;
    }
    delay(30);
  } else {
    // LED sofort ausschalten, wenn DCC-Befehl LOW ist
    analogWrite(ledPin, 0);
    brightness = 0;
  }
}
```

Mehrere LEDs, wobei jede LED auf eine eigene DCC Adresse hört

DCC-Signal an Arduino-Pin 2 (über Optokoppler oder DCC-Shield)

Jede LED an einen PWM-fähigen Pin (z.B. 3, 5, 6, 9, 10, 11)

```
#include <NmraDcc.h>

NmraDcc Dcc;
const int dccPin = 2; // DCC-Eingang

// LED-Pins und zugehörige DCC-Adressen
struct LED {
  int pin;
  int dccAddr;
  int brightness;
  int fadeAmount;
  bool isFading;
};

LED leds[] = {
  {3, 1, 0, 5, false}, // LED an Pin 3, DCC-Adresse 1
  {5, 2, 0, 5, false}, // LED an Pin 5, DCC-Adresse 2
  {6, 3, 0, 5, false}, // LED an Pin 6, DCC-Adresse 3
  {9, 4, 0, 5, false}, // LED an Pin 9, DCC-Adresse 4
```

```
{10, 5, 0, 5, false}, // LED an Pin 10, DCC-Adresse 5
{11, 6, 0, 5, false} // LED an Pin 11, DCC-Adresse 6
};
const int ledCount = 6;

void setup() {
  for (int i = 0; i < ledCount; i++) {
    pinMode(leds[i].pin, OUTPUT);
  }
  Dcc.pin(dccPin, 0);
  Dcc.begin();
}

void loop() {
  Dcc.process();
  for (int i = 0; i < ledCount; i++) {
    if (leds[i].isFading) {
      leds[i].brightness += leds[i].fadeAmount;
      if (leds[i].brightness <= 0 || leds[i].brightness >= 255) {
        leds[i].fadeAmount = -leds[i].fadeAmount;
      }
      analogWrite(leds[i].pin, leds[i].brightness);
      delay(30);
    }
  }
}

// Wird aufgerufen, wenn ein DCC-Accessory-Befehl kommt
void notifyDccAccTurnout(uint16_t addr, uint8_t direction, uint8_t
outputPower) {
  for (int i = 0; i < ledCount; i++) {
    if (leds[i].dccAddr == addr) {
      if (direction == 1) {
        leds[i].isFading = true; // LED faden lassen
      } else {
        leds[i].isFading = false;
        analogWrite(leds[i].pin, 0); // LED sofort aus
        leds[i].brightness = 0;
      }
    }
  }
}
```

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