

# **DR-VE-10-MO**

User Manual

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# 1 Introduction

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- The DR-VE-10-MO is a non-inverting single-ended modulators driver module for analog, pulse, or digital application.
- As it is an active device, the DR-VE-10-MO requires a DC power supply [12V – 0.45A]. The connection between the power supply and the driver is performed thanks to the provided power supply cable (banana plugs to 2-pin Molex).



*DR-VE-10-MO power supply cable*

- For external control, the driver requires a connection to a computer via the provided COM cable (USB to 3-pin Molex) and the use of a provided dedicated software. This software can be downloaded from our website: <https://photonics.ixblue.com>.

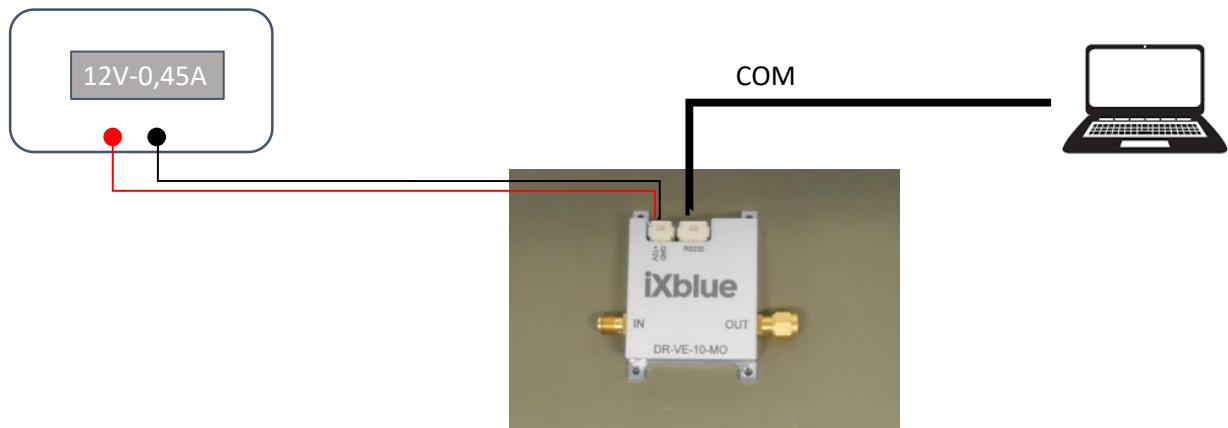


*DR-VE-10-MO COM Cable*

- Required equipments:
  - DR-VE-10-MO driver with iXblue dedicated heat-sink or adequate cooling element.
  - DC power supply [12V – 0.45A] and provided power supply cable.
  - Computer with iXblue's "DR-VE-10-MO Control" software or a third-party HyperTerminal software and provided COM cable.
  - Minimum Computer Requirements:
    - Windows 7 / 8 / 10
    - One USB port for each DR-VE-10-MO to drive.

## 2 Set-up:

- The diagram of the basic DR-VE-10-MO set-up is as followed:



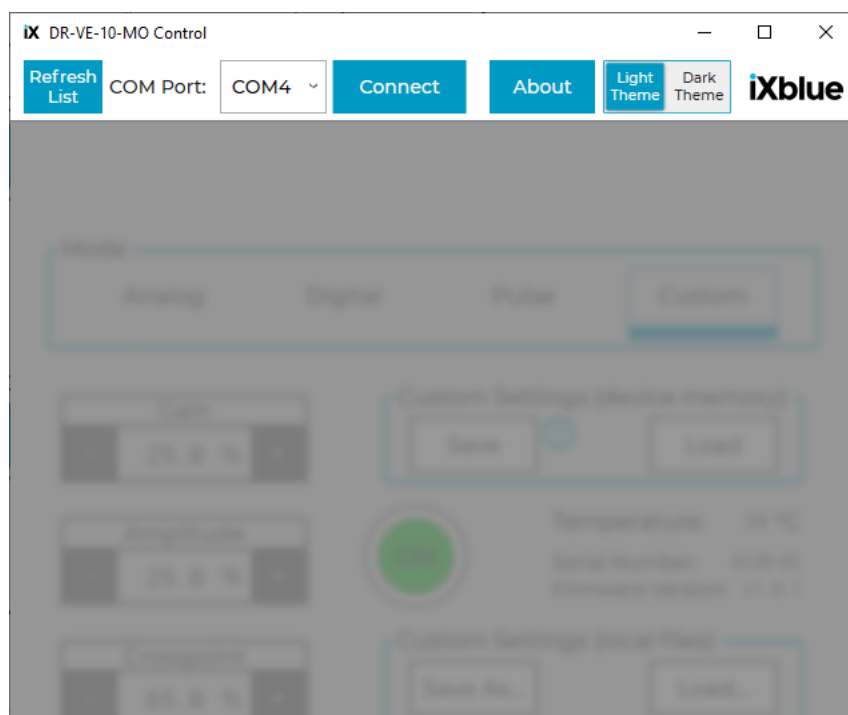
- Recommended operating sequence:
  1. Ensure that input RF source (for example Pulse Pattern Generator, PPG) is off.
  2. Attach a 50 Ohm load to output before supplying DC power to the amplifier.
  3. Set +12V on the DC power supply, 0,45A max, output OFF (any standard DC power supply with current monitoring and ON / OFF switch is acceptable).
  4. Connect the power supply cable. Connect the COM cable.
  5. Switch the DC power to ON.

## 3 Interface - Operation:

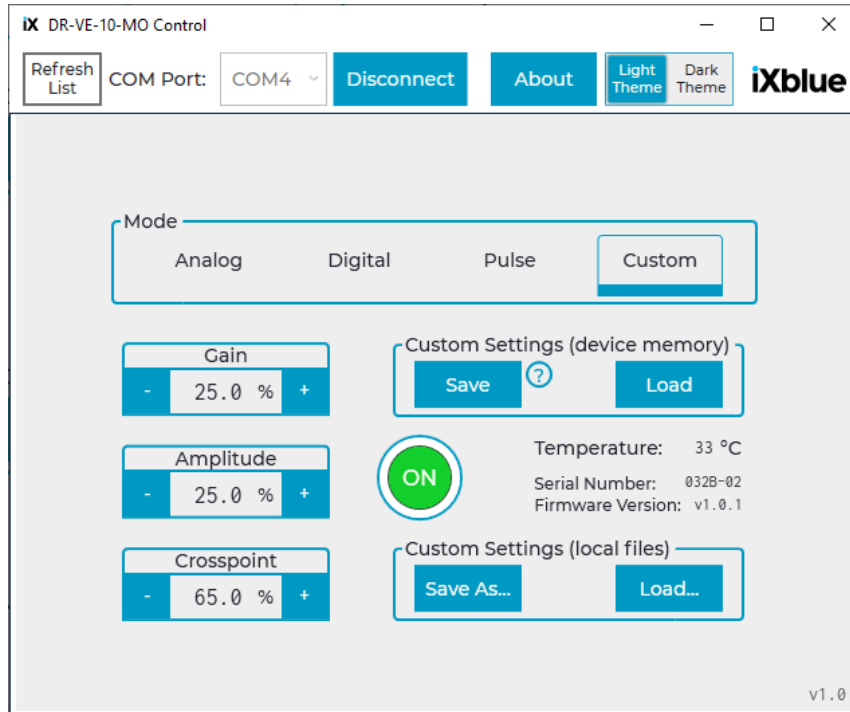
- Install the **DR-VE-10-MO Control** application by running the provided Setup file (DR-VE-10-MO Control1 Setup.exe) then following the instructions given by the install program. **This requires administrator privileges.**



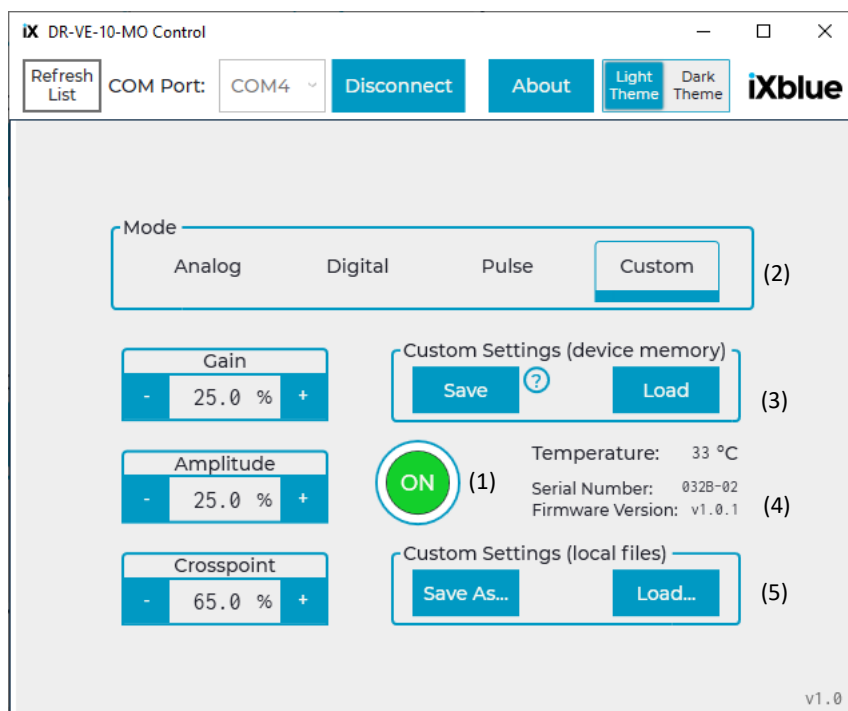
- Launch the “DR-VE-10-MO Control1” application that was just installed (by default, a shortcut is added on the Windows Desktop by the setup program). The first step is to select the correct COM port. To proceed, click on the down arrow of the list box and select the COM port connected to the controller.





- After selecting your port, click on “Connect” to activate the interface (The DR-VE-10-MO has to be powered up). If the connection fails, please check the cable connection or try another COM Port.



- Interface general considerations:



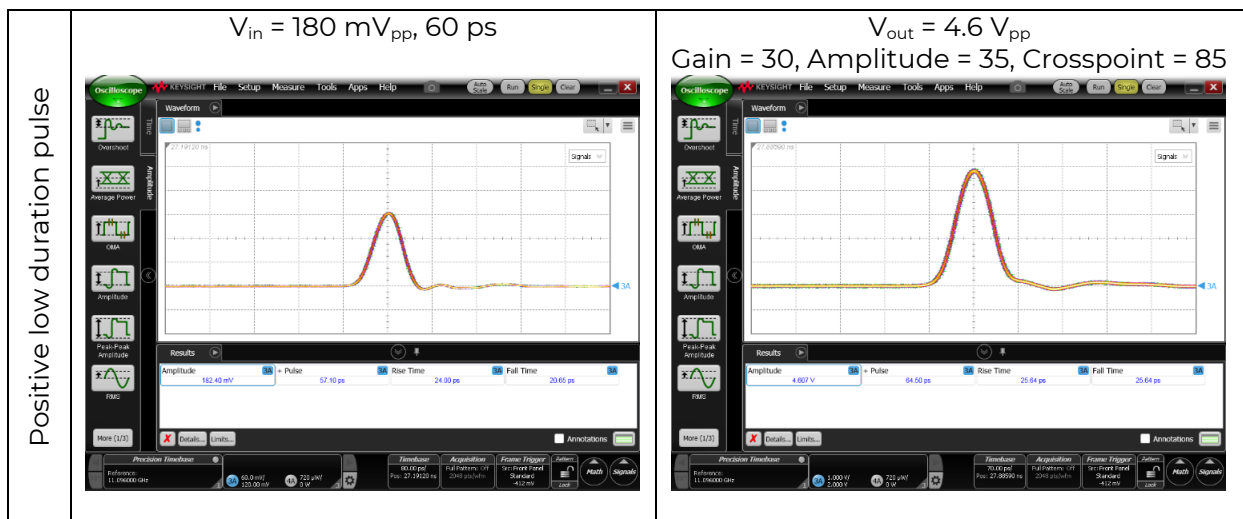
- (1): ON/OFF button : Allows the user to enable / disable the RF driver.
- (2): **Mode**: Allows the user to select one of the three pre-registered operating modes: **Analog** , **Digital** , **Pulse** . Each pre-registered mode corresponds to a set of three parameters [Gain – Amplitude – Crosspoint] pre-optimized for a dedicated application.
- The 4<sup>th</sup> mode called **Custom** allows the user to set its own settings [Gain – Amplitude – Crosspoint] independently of the three pre-registered modes and to store them into the device memory. Also, this “Custom Mode” allows the user to store on the device memory the status “ON” (enabled) or “OFF” (disabled) of the driver.
- [Gain – Amplitude – Crosspoint] adjustment: These three functions control the Gain, Amplitude, and Crosspoint of the driver. These parameters have to be adjusted depending on the application (see paragraph “4”). The tunability goes from 0% (minimum value) to 100% (maximum value).
- (3): **Custom Settings (device memory)**: allows the user to set its own “Custom Mode” parameters and to store them into the device memory by clicking on the **Save** button. These settings can be recalled by clicking on the **Load** button and will be automatically applied to the device.
- Once the “Custom Mode” parameters are set and stored into the device memory, the DR-VE-10-MO will automatically recall them at the next power up. Therefore, the DR-VE-10-MO can be used without a computer connected to it until new adjustments are needed.
- (4): Display of internal temperature, serial number and firmware version of the device. The internal temperature should not exceed 70°C. If so, disable the driver by clicking on the ON/OFF button . Use ixblue dedicated Heat-sink or adequate cooling element to avoid excess heat.
- (5): **Custom Settings (local files)**: allows the user to set its own settings and to store them on the local computer (.ini file). Clicking on the **Load** button allows the user to recall settings previously stored on local files. These settings will be automatically applied to the device.








## 4 Adjustment procedure for signal optimization:

- Adjust the "Gain" parameter around 25-30 (medium gain).
- Adjust the "Crosspoint" parameter, this one controls the positive/negative distribution of the output signal and depends on signal type:
  - If unipolar (+): Crosspoint = [85-95]
  - If unipolar (-): Crosspoint = [40-55]
  - If bipolar (symmetrical): Crosspoint = [60-75]
- Adjust the output amplitude by using the "Amplitude" parameter. If the output level is too low, adjust the "Gain" parameter or increase the incoming signal level  $V_{in}$ . Do not increase too much the "Gain" parameter or input amplitude to avoid signal distortion.
- If the output level is too high or the signal distorted, decrease the "Gain" parameter or input amplitude and readjust the "Crosspoint" parameter if needed.
- For linear signal amplification,  $V_{in}$  should be lower than  $0.15 V_{pp}$ . For non-linear application, adjust  $V_{in} \approx 0.2 V_{pp}$ .

- Input / Output signal examples:



Negative long duration pulse	<p><math>V_{in} = 130 \text{ mV}_{pp}, 250 \text{ ns (-)}</math></p> 	<p><math>V_{out} = 3.8 \text{ V}_{pp}</math> Gain = 30, Amplitude = 35, Crosspoint = 40</p> 
Positive linear pulse	<p><math>V_{in} = 120 \text{ mV}_{pp}, \text{ramp (+)}</math></p> 	<p><math>V_{out} = 4.7 \text{ V}_{pp}</math> Gain = 30, Amplitude = 60, Crosspoint = 80</p> 
Digital signal	<p><math>V_{in} = 220 \text{ mV}_{pp}, 12.5 \text{ Gb/s}</math></p> 	<p><math>V_{out} = 6.4 \text{ V}_{pp}</math> Gain = 35, Amplitude = 40, Crosspoint = 65</p> 