



## Two New Valve Drivers Four Personalities



**ExDR-0101A: Single-input valve driver offers fully configurable control of proportional valve or time-based ramping for powertrain applications.**



**ExDR-0201A: Single-input, dual output valve driver controls double-coil proportional directional valve or proportional fan drive with reverse.**

### Overview

HydraForce continues to expand its line of electronic controls with two new economical, compact, digital valve drivers.

Digital control of your valves means you can set the parameters for your application in the software and every driver will perform identically. There is no tuning or adjustment required to dial-in the driver as with older analog controls.

### All New Inside

These two valve drivers are all new inside with:

- 32 bit ARM processor
- 12 bit A/D converter
- Low-frequency PWM output
- Up to three control breakpoints per output
- Input and output ramps
- Status LED(s)

### Standard Features

The ExDR valve drivers are compact, economical, reliable electronic drivers for proportional solenoid valves. These units are fully configurable using a computer and serial cable or CAN to USB adapter. No programming is required.

The units mount directly onto a solenoid coil via Deutsch DT06 2-pin connector. Power, input, and communications, as well as additional coil output (ExDR-0201A) are contained in a Deutsch DT04 4-pin or 8-pin connector.

One or two status LEDs indicate coil output and also communicate error conditions. The sealed units are rated to IP69K for ingress protection, and are fully CE qualified.

For detailed information and specifications, visit [www.hydraforce.com](http://www.hydraforce.com) or contact your local HydraForce representative at [www.hydraforce.com/distrib/world.htm](http://www.hydraforce.com/distrib/world.htm)

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ISO 9001: 2008

### ExDR-0101A

The ExDR-0101A is a single output valve driver with serial communications for programming and flashing the firmware. It accepts analog voltage, current, resistance, or digital input. It drives a variety of proportional solenoid valves from HydraForce or other providers.

With two available firmware personalities this versatile driver can provide output curve shaping and metering with independent input and output ramps. You can set unique ramps for rising or falling signals. It protects your application from signal, output, or voltage faults, and an LED indicates output level or fault conditions.

#### Design Specifications

- 9–32 Vdc operating voltage
- 50–2000 mA continuous current output
- 3 A hot-shot up to 1 second duration
- 40–400 Hz PWM frequency
- 32-bit 48 MHz ARM microprocessor
- 32 kB flash memory

#### Firmware Personalities

- EVDR — single input valve driver
- ETDR — time-based valve driver

### ExDR-0201A

The ExDR-0201A is a dual output valve driver featuring SAE J1939 CAN communications. Flashing the firmware, changing operating parameters, and input/output monitoring are possible through CAN. The driver can operate independently or as a slave, responding to messages on the CAN network.

This unit drives two-coil proportional directional valves. It features separate metering profiles for A and B coils and independent input/output ramps with unique rates for rising and falling signals. Using the EFDR firmware personality you can also drive a proportional fan control with reversing valve.

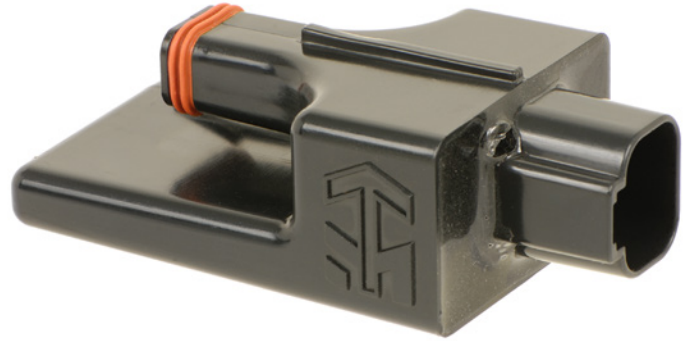
Fault monitoring protects your applications from over/under voltage, signal errors, and output faults. Two status LEDs indicate the output level of each coil and communication faults or other fault conditions.

#### Design Specifications

- 9–36 Vdc operating voltage
- 50–2000 mA continuous current output
- 40–400 Hz PWM frequency
- 32-bit 72 MHz ARM microprocessor
- 64 kB flash memory

#### Firmware Personalities

- EVDR — single input valve driver
- EFDR — reversing fan drive control



- 12 bit A/D converter
- -40 to 85 °C (-40 to 185 °F) operating temperature
- IP69K ingress protection
- Deutsch DT-Series sealed connectors
- Serial TTL (for flashing and programming)



- 12 bit A/D converter
- -40 to 85 °C (-40 to 185 °F) operating temperature
- IP69K ingress protection
- Deutsch DT-Series sealed connectors
- SAE J1939 CAN communications and networking

## Firmware Personalities

Each driver has two firmware choices. The firmware sets the operating personality of the driver. You can flash the firmware to update to a new revision or change operating personality any time. The latest firmware is always available for free download from the electronics portal at [www.hydraforce.com/electronics](http://www.hydraforce.com/electronics).

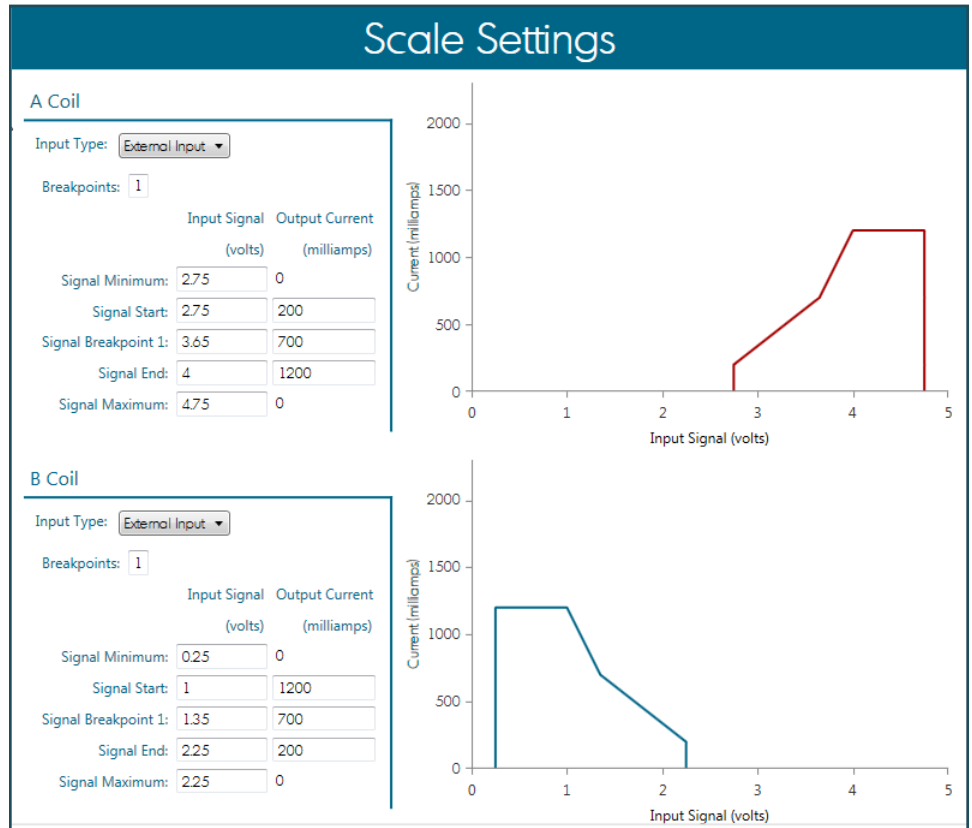
### EVDR — Valve Driver Personality

#### EVDR-0101A / EVDR-0201A

The EDVR personality is a proportional valve driver. It allows you to set a custom metering profile for a proportional solenoid valve. The profile can have up to three breakpoints that you define. You can also set independent input and output ramps with unique rates for rising and falling signals.

#### User-defined Parameters

- Input type
- Bias (for digital inputs)
- Signal error min./max.
- Up to three output scale breakpoints
- PWM frequency
- Input ramp up/down rate
- Output ramp up/down rate
- CAN message parameters (EVDR-0201A)



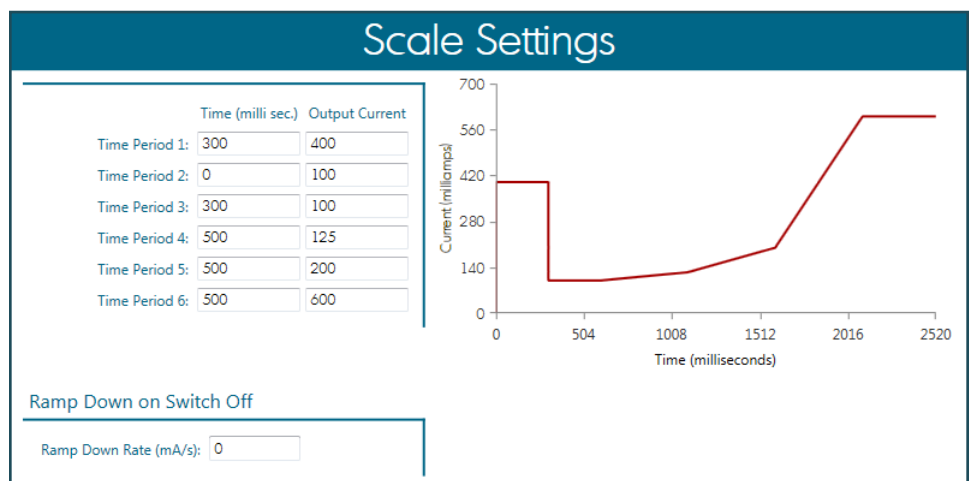
### ETDR — Time-Based Valve Driver

#### ETDR-0101A

The ETDR firmware personality allows time-based shaping of the output for transmission/clutch control, soft start, hotshot, or other applications. The input signal triggers the output sequence. You can define six output levels and their duration in ms. You can also define the ramp down rate for output to fall back to zero after sequence completes.

#### User-defined Parameters

- Input bias (pull-up/down)
- Output scale breakpoints (up to six)
- PWM frequency
- Ramp down rate (mA/s)



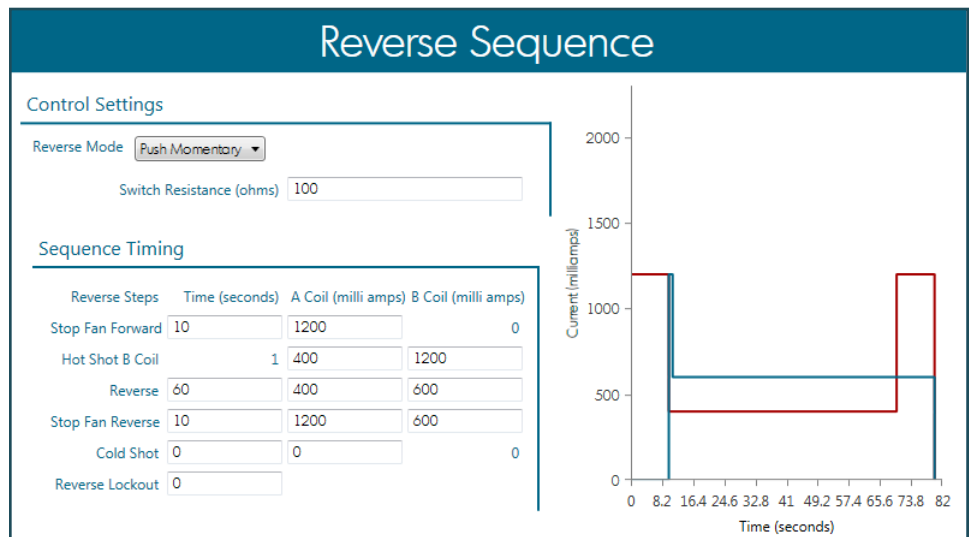
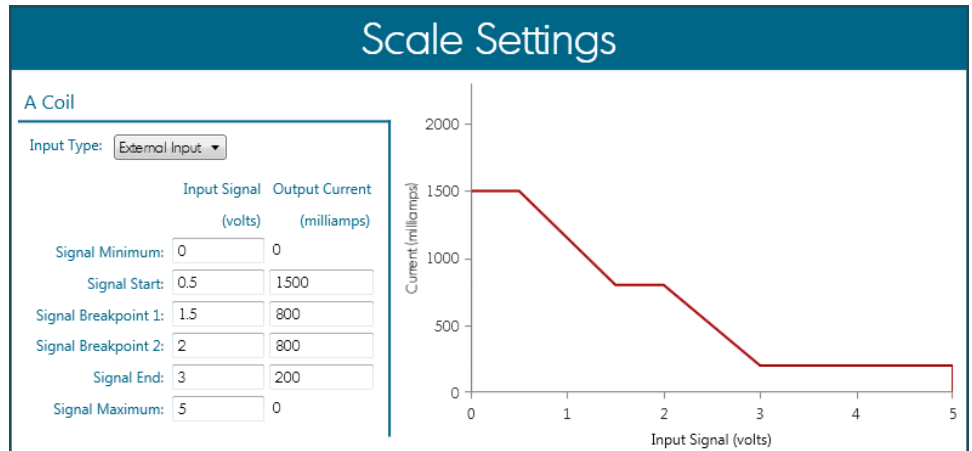
### EFDR — Proportional Reversing Fan Drive Control

#### EFDR-0201A

The EFDR fan drive personality allows control of a reversible hydraulic fan drive. You can scale fan speed to match input from a temperature sensor, or respond to CAN messages from the engine control module. The control can reverse fan direction: periodically, by user input (press or press and hold), on over-temperature condition, or trigger by CAN message. You can set sequencing parameters for controlling both the proportional valve and reversing valve during a reversal event.

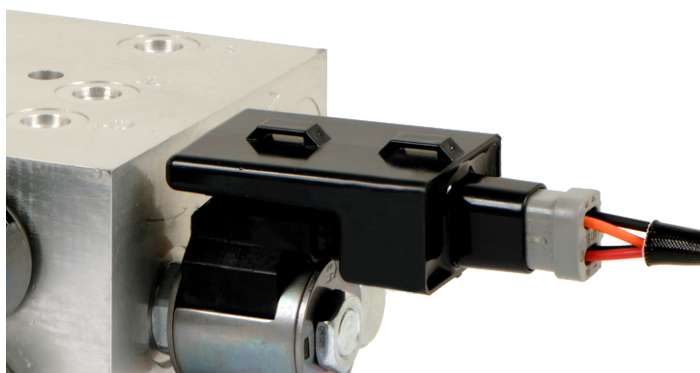
#### User-defined Parameters

- Input type
- Bias (for PWM or frequency inputs)
- Signal error min./max.
- Output scale breakpoints
- Reverse mode (trigger)
- Reverse sequence parameters
- PWM frequency
- Output ramp up/ ramp down rate
- CAN message parameters



### HF-Impulse

HydraForce has developed an easy to use configuration platform: HF-Impulse, available for free download from the HydraForce electronics portal at [www.hydraforce.com/electronics](http://www.hydraforce.com/electronics). HF-Impulse allows you to flash devices with the latest firmware, change their personality, and configure all parameters for operation. You can even monitor operation of ExDR-0201A via the CAN interface for performance testing and troubleshooting. Once the configuration parameters are set, simply download to the device and you're ready to run.



### ExDR Drives Your Valves to the Next Level

For economical, accurate digital control, the HydraForce ExDR valve drivers offer:

- Easy and repeatable configuration
- Compact on-valve mounting
- Choice of control personalities
- Excellent durability and reliability
- IP69K ingress protection
- CAN communications and networking (ExDR-0201A)