

**kdScientific**

# Gemini 88 Plus

## Dual Rate Syringe Pump



Large touch screen display allows quick and easy setup

Two separate syringe pumps in one instrument

Compatible with a wide variety of syringes

TTL, USB & RS-232 compatible

Continuous fluid delivery

High or low pressure

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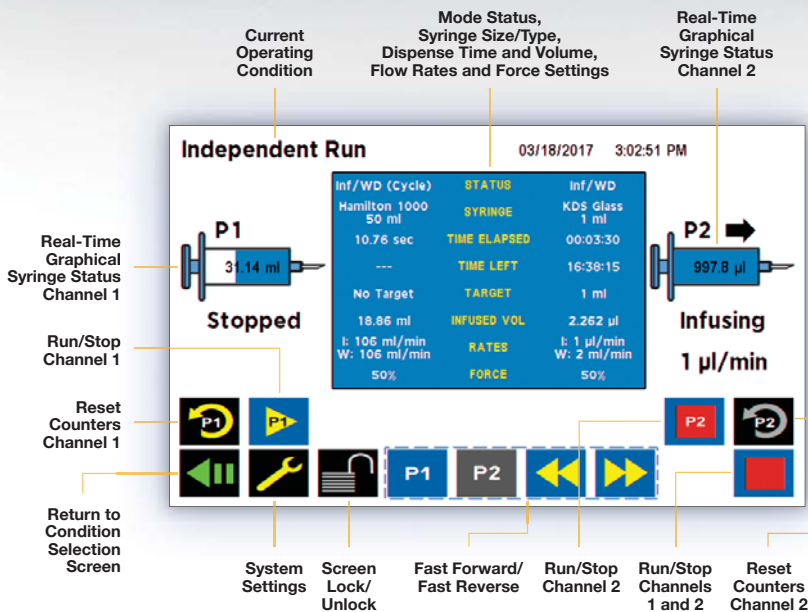
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# Gemini 88 Plus Dual Rate Syringe Pump

KD Scientific offers the **NEW** Gemini 88 Plus Dual Rate Syringe Pump. This unique pump is really two pumps in one, by providing two independent pumping channels linked through hardware and software.

The dual rate syringe pump can infuse simultaneously at different rates, or infuse with one syringe and withdraw with the other. When combined with a valve box, it provides the continuous delivery of a peristaltic or piston pump with the accuracy, absence of pulsation and low flow rates of a syringe pump. This functionality allows continuous infusion or withdrawal, 24 hours a day, 365 days a year with the accuracy and low flow of every KD Scientific syringe pump.

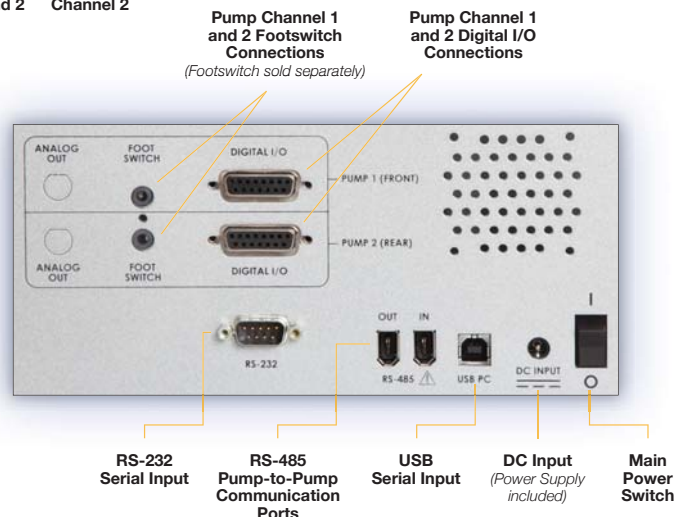


## Graphical User Interface

The intuitive Gemini 88 Plus graphical user interface controlled with a large 7" LCD color touchscreen display allows quick and easy setup. The display run screen presents the user with all key dispensing parameters in real time. Syringe tables containing all major syringe manufacturers allow simple selection of any compatible syringe size. Audible Alarms, Adjustable Force and Screen Lock are all features that are available with a touch of the screen.

## Connectivity & Communication

The Gemini 88 Plus comes standard with USB and RS-232 for PC communication and RS-485 for pump-to-pump communication. An entire suite of ASCII commands is available to control the pump remotely with a PC. The pump contains a footswitch input and digital input/output for each independent pumping channel.



## Features, Benefits & Applications

The Gemini 88 Plus Dual Rate Syringe Pump opens up whole new pumping possibilities.

Three operating conditions named **Independent**, **Reciprocating** and **Twin** are available as standard features to satisfy various applications in life science and industrial settings.

- **Continuous injection for long-term toxicology testing**
- **The injection of dyes, perfumes and flavoring in industrial applications**
- **Applications with liquids or viscous materials in micro-manufacturing**
- **Continuous injections of reactants into reactor vessels**
- **Simultaneous samplings from two sites**

Various applications can benefit from the three operating conditions. All three conditions come with the Gemini 88 Plus. No additional upgrades are required.

KD Scientific syringe pumps are for laboratory use only. They have not been approved by the FDA for human clinical use.

## Specifications

<b>Type</b>	Microprocessor dual rate infuse/withdraw continuous syringe pump
<b>Accuracy</b>	±0.25%
<b>Reproducibility</b>	±0.05%
<b>Syringe:</b>	
<b>Type</b>	Glass, plastic and stainless steel
<b>Size Minimum</b>	0.5 µl (0.103 mm minimum inner diameter)
<b>Size Maximum</b>	60 ml (32.573 mm maximum inner diameter)*
<b>Flow Rate:</b>	
<b>Minimum</b>	1.02 pl/min (0.5 µl syringe, 0.103 mm inner diameter)
<b>Maximum</b>	106 ml/min (60 ml syringe, 32.573 mm diameter)
<b>Display</b>	7-in color display with touchscreen
<b>Connectors:</b>	
<b>USB</b>	Type B
<b>RS-232</b>	9-pin D-sub connector
<b>RS-485</b>	IEEE-1394, 6 pos for pump-pump communication
<b>TTL Input/Output</b>	Two 15-pin D-sub connectors, one for each pump mechanism
<b>Footswitch</b>	Two phono plug inputs, one for each pump mechanism
<b>Average Linear Force</b>	70 lb (31.75 kg) at 100% force setting up to a flow rate of 90 ml/min using up to a 60 ml syringe with a 32.573 mm inner diameter. 50 lb (22.6 kg) at 100% force setting for flow rates 90 ml/min to 106 ml/min using the same size syringe.

<b>Power Supply</b>	Input 100-240 VAC, 50-60 Hz, Output 30 V 1.66 A 50 Watts
<b>Weight</b>	21 lb (9.09 kg)
<b>Dimensions (L x D x H)</b>	11 x 15 x 8 in (28 x 39 x 21 cm)
<b>Classification</b>	Class I
<b>Pollution</b>	Degree 1
<b>Installation</b>	Category II
<b>Regulatory Certifications</b>	CE, ETL (UL & CSA), CB Scheme, EU RoHS, WEEE

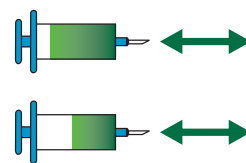
\*Note: Some larger syringes may be compatible with the Gemini 88 Plus. Please contact Technical Support for more information.

## Ordering Information

Order #	Product
<b>78-8088</b>	Gemini 88 Plus Dual Rate Syringe Pump
<b>Accessories</b>	
<b>78-0225</b>	Footswitch (with Phono Plug)
<b>78-8304</b>	RS-485 Cable for Pump-to-Pump Communication, 0.5 m
<b>78-8305</b>	RS-485 Cable for Pump-to-Pump Communication, 2.0 m
<b>78-8306</b>	USB Cable for PC to Pump Communication, 2.0 m
<b>78-8307</b>	USB Cable for PC to Pump Communication, 5.0 m
<b>78-8308</b>	RS-232 Cable for PC to Pump Communication, 2.0 m

### Independent Condition

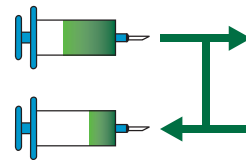
Independent Condition allows the Gemini 88 Plus to operate as two separate syringe pumps named P1 and P2. Each syringe will operate independently with different syringe types, sizes, force, or target (volume or time, mode dependent).



	Mode	Syringe	Rate	Target Volume/Time
P1	Infuse, Withdraw, Infuse/Withdraw, Withdraw/Infuse	Any size/type 0.5 µl – 60 ml	Any within syringe capability	Any (Mode Dependent)
P2	Infuse, Withdraw, Infuse/Withdraw, Withdraw/Infuse	Any size/type 0.5 µl – 60 ml	Any within syringe capability	Same as P1

### Reciprocating Condition

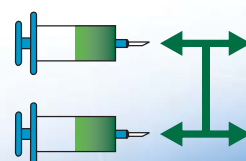
In Reciprocating Condition, both syringe channels move in opposite directions at the same rate using the same syringe size and type. When combined with a valve box, the Reciprocating Condition can provide the continuous fluidic delivery of a peristaltic pump with the accurate, pulseless, low flow rates provided by a syringe pump.



	Mode	Syringe	Rate	Target Volume/Time
P1	Infuse/Withdraw, Withdraw/Infuse	Any size/type 0.5 µl – 60 ml	Any within syringe capability	Any
P2	Opposite of P1	Same as P1	Same as P1	Same as P1

### Twin Condition

Twin Condition allows both syringes to operate in the same mode using the exact same syringe type, syringe size, force, target (volume or time) and flow rate settings. The pump also allows the user to combine both flows for higher speed and volume infusion applications.



	Mode	Syringe	Rate	Target Volume/Time
P1	Infuse, Withdraw, Infuse/Withdraw, Withdraw/Infuse	Any size/type 0.5 µl – 60 ml	Any within syringe capability	Any (Mode Dependent)
P2	Same as P1	Same as P1	Same as P1	Same as P1