



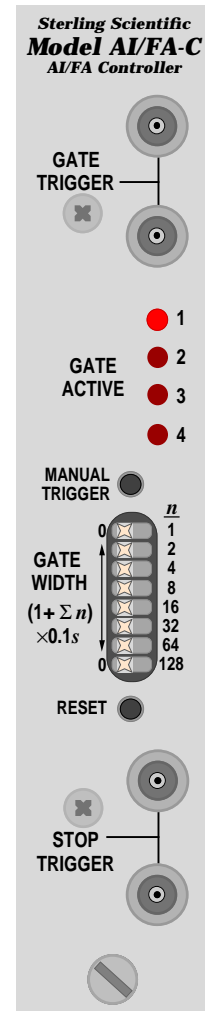
# GATE CONTROLLER FOR MODEL AI/FA DUAL FUNCTION LONG PULSE ANALOG INTEGRATOR AND FILTERING AMPLIFIER

### APPLICATIONS:

- Magnetic fluxmeter for time varying magnetic fields or inhomogeneous DC (permanent) magnetic fields (with user supplied loop coil sensors)
- Electrically isolated current measurements (with Rogowski loop sensors)
- Electronic mathematical integration of any voltage source, such as accelerometer measurements of velocity and position
- Convenient modular design for applications requiring many simultaneous measurements, such as magnetic field spatial structures

### FEATURES:

- Auto-resetting gate control initiated by an external GATE TRIGGER
- Adjustable GATE WIDTH time up to 25.6 seconds in 0.1 second increments
- Optional 4 separate gate activation times using 4 sequential GATE TRIGGER's
- Optional forced-reset gate control by an external STOP TRIGGER



Actual size front panel  
Lemo-style connectors  
(BNC style optional)

Sterling Scientific's *Model AI/FA-C* provides the gate function control for *Model AI/FA*, our *Dual Function Long Pulse Analog Integrator and Filtering Amplifier*. Used with magnetic "pickup" coil loop sensors, *Model AI/FA* transforms the sensor signal into a measurement of magnetic field (or electric current) by integrating the signal voltage. The main challenge in long pulse analog integration is avoiding the slow "drift" of the integrator output resulting from steady accumulation of the unavoidable residual in zeroing the input signal. The *Model AI/FA* uses an auto-zeroing feedback scheme to minimize the input offset voltage of the integrating operational amplifier, permitting high gain integration for long time periods. To achieve accurate near-dc response, this auto-zeroing feedback must be gated off using *Model AI/FA-C* while a measurement is performed. (Optional remote control of the integrator and amplifier gains is provided using gate control module *Model AI/FA-CP\**.)

In coordination with switch settings on the front panel of the *Model AI/FA* integrator module, simple yet flexible system-wide gate control is provided by *Model AI/FA-C*. When a TTL compatible trigger is applied to the **GATE TRIGGER** input, the auto-zeroing in the integrator modules is deactivated (gated off) for an amount of time set by a timer inside the *Model AI/FA-C* control module. The timer is adjustable from 0.1 to 25.6 seconds in 0.1 second increments using the **GATE WIDTH** front panel 8-bit DIP switch. When the timer reaches its set value, the controller automatically re-enables the auto-zeroing feedback in the integrator modules and resets the controller's trigger logic. In the simplest mode of operation, the only required input is one trigger. For greater timing flexibility, up to 3 additional (four total) sequential gate triggers can be applied at any time while the control module timer is active. Which of these 4 triggers activates the gate in a particular integrator module is determined by the integrator module's front panel DIP switch settings (2-bit encoding). Independent of which trigger is used to activate the gate, when the timer reaches its set value, the auto-zeroing in all integrators is re-enabled (see logic diagram). To override the controller's automatic timing, a TTL compatible trigger can be applied to the **STOP TRIGGER** input, which will force a reset of the auto-zeroing gate control. This is useful when dynamic gate timing is essential. Manual gate triggering is provided by depressing the **MANUAL TRIGGER** momentary pushbutton switch. Depressing the **RESET** momentary pushbutton switch enables a system-wide logic reset to power-on

\**Model AI/FA-CP* in development. Control via RS232 and/or GPIB planned.

default states. Both inputs (**GATE TRIGGER** and **STOP TRIGGER**) are daisy-chained for situations where more than one control module are needed but with identical timing.

The *Model AI/FA-C* module is constructed in a cost-efficient 1 inch wide “extended front panel” (EFP) format which mounts in Sterling Scientific’s *AI/FA-CAGE*, a 5.25 inch standard height rack mount card cage with backplane (19 inch wide). The cage holds up to 16 modules (of any type). The gate control is communicated on the backplane, so *only one control module is required per cage*. Also, the backplane is easily extendable to other cages, allowing one control module to operate the entire extended backplane cage system.

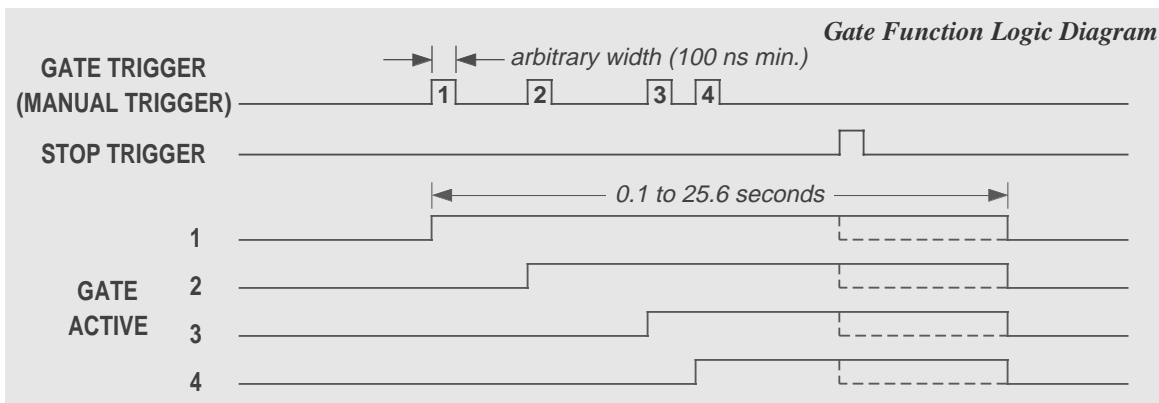
**GATE CONTROL SPECIFICATIONS:**

ALL INPUTS	(LS) TTL compatible
INPUT IMPEDANCE	51 Ω board jumper selectable
GATE INPUT TRIGGER(S)	≤4 sequential, 100 ns minimum width, rising edge active
STOP INPUT TRIGGER	100 ns minimum width, rising edge active
GATE WIDTH	0.1 to 25.6 seconds in 0.1 second increments (8-bit encoded)

**Model AI/FA Gate Trigger Selection Using Front Panel DIP Switches**

	GATE 2	GATE 1
1	0	0
GATE 2	0	1
ACTIVE 3	1	0
4	1	1

(see Model AI/FA information sheet or User’s Manual)



**FRONT PANEL CONNECTORS:**

GATE & STOP two daisy-chained LEMO ERA.00.250.CTL or equivalent coaxial (Coaxial BNC connectors are optional by special request.)

**FRONT PANEL CONTROLS AND INDICATORS:**

MANUAL GATE TRIGGER	momentary pushbutton switch
SYSTEM RESET	momentary pushbutton switch
GATE WIDTH	8-position DIP switch
GATE ACTIVE INDICATORS	1, 2, 3, and 4 red LEDs



AI/FA-CAGE with installed Model AI/FA and AI/FA-C modules

**REQUIRED PERIPHERAL EQUIPMENT:**

INTEGRATOR MODULE	Sterling Scientific’s <i>Model AI/FA</i> long pulse integrator & amplifier
EFP MODULE CAGE	Sterling Scientific’s <i>AI/FA-CAGE</i> (includes backplane)
POWER SUPPLY	user supplied ±20-24 VDC, 20 mA per module (quiescent)

For purposes of continued product improvement, Sterling Scientific reserves the right to change these specifications without notice.