SDPROC

Microprocessor driven digital Command Modules are used in conjunction with any analog or digital mass flow controllers with 0-5 Vdc input /output signals. One, two, three and four channel Command Module configurations are available. Command Modules contain appropriate power supplies, 24x2 alpha-numeric dot matrix display readout, and four panel buttons which provide complete control over all the various functions necessary to measure and/or control flow.

Programming

It is easy to program the SMART DPROC using a logically organized, modular menu. The operator quickly accesses a desired function by branching through the multi-level tree structure, rather than scrolling through the entire menu. RS-232 serial communication interface is standard for all models and supported via a 9 pin “D”-connector on the back panel of the Command Module. RS-232 Software interface commands set allows communications with the unit using either a custom software program or a “dumb terminal” and provide complete control over all modes and functions.

PROGRAMMABLE BATCH FLOW CONTROL

The Batch Flow Control allows execution of custom, user preset program of up to sixteen steps. During execution of the program the user can activate or deactivate the LOOP mode. Various flow configurations may be preprogrammed: ramping, pulsing, linearized increasing and/or decreasing of the flow.

Optional built-in Ethernet interface allows accessing any Internet-connected SDPROC from a browser on your work station, PC, or laptop computer.

Regardless of where you are, your Command Module is as close as the nearest browser! There are two levels of Ethernet based Remote Controls: HTML web server and TELNET. The HTML web server, which is hosted on the Command Module lets one view CURRENT FLOW RATE, CONTROL VALVE MODE and/or SET POINT, MONITOR TOTALIZER READING FOR SELECTED CHANNEL. The TELNET console provides complete control over all modes and functions and using the same Software interface commands set as the RS-232 communication interface.

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Design Features

ENGINEERING UNITS

The flow set points, measured gas flow and associated totalizer data are scaled directly in engineering units via front panel keypad, RS-232 or Ethernet interface.

The following units of measure are supported:

%F.S., SLPM, L/s, mL/min, mL/h, SCFM, SCFH, SCMM, SCMH, LBPM, LBPH, GRPM, GRPH.

USER SELECTABLE REFERENCE FOR SET POINT

The INTERNAL, EXTERNAL, PROGRAM refers to the point of origin for the Set Point signal.

In Internal reference mode, the user sets the control signal with SDPROC controls (via front panel keypad, RS-232 or Ethernet interface).

In External reference modE, the user sets the control signal from a remote location (via the DATA IN/OUT 25-pin “D”-connector on the rear panel).

In Program mode the set point signal will be driven by user’s custom program stored in the EEPROM. There are three Program modes: BATCH, TIMER and RATIO*.

*RATIO mode not available for one channel module.

PROGRAMMABLE TIMER FLOW CONTROL

The Timer Flow Control allows execution of custom, user preset program of up to 96 steps.

Each step can be preprogrammed for a particular date, time, and set point value. Every step has two fields: starting date, time and set point in % F.S.

RATIO FLOW CONTROL

The Ratio Flow allows controlling flow of the mixture of up to four different gases (for 4 channel Command Module) with preset values of the ratio in % for each channel. The flow rate of the mixture can be incremented or decremented by changing the set point of the master channel #1.

FLOW ALARMS

High and Low gas flow ALARM limits can be preprogrammed for each channel. ALARM conditions become true when the difference between current readings and installed set points are equal or more than corresponding values of high and low alarm levels.

Alarm action can be assigned with preset delay interval (0-3600 seconds) to one of the following:

- Contact closer (separate for High and Low alarm).
- Buzzer audible signal.
- Valve shut down (Close).

CONTACT CLOSURES

Two sets of dry contact relay outputs for each channel are provided to actuate user supplied equipment. The relays can be assigned to switch when a specified event occurs (e.g. when a low or high flow alarm limit is exceeded or when the totalizer reaches a specified value).

TOTALIZER

The total volume of the gas is calculated by integrating the actual gas flow rate with respect to time.

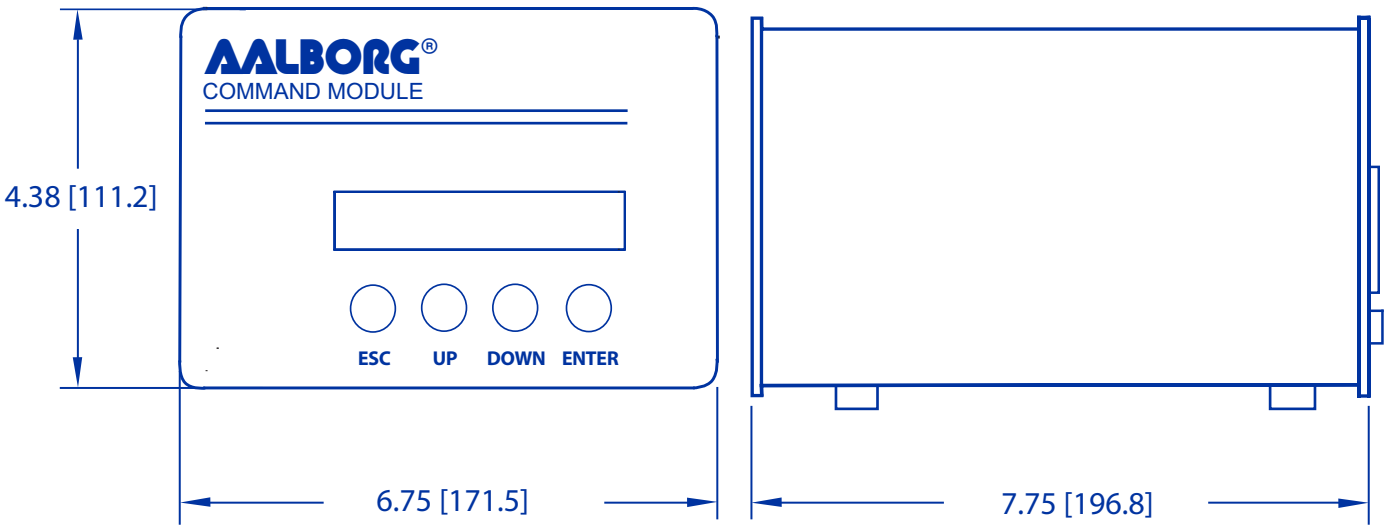
Both keypad menu and digital interface commands are provided to:

- Set the totalizer to ZERO.
- Start the totalizer at a preset flow.
- Assign action at a preset total volume.
- Start/Stop totalizing the flow.
- Read totalizer.

Totalizer conditions become true, when the totalizer, and the “Stop at Total” volumes are equal.

Totalizer action can be assigned to one of the following:

- Contact closer.
- Audible Buzzer.
- Valve shut down (Close).



DIMENSIONS SHOWN IN BRACKETS ARE IN MILLIMETERS

TABLE 40 - SPECIFICATIONS	
ENVIRONMENTAL (per IEC 664)	Installation Level II; Pollution degree II.
POWER SUPPLY:	85 to 240 VAC (47 to 440 Hz); 120 to 370 Vdc 2A max.
FUSE:	2A on input power line. When changing, unplug the device from power source. Replace only with fuse 5mm 2A/250V °F.
DISPLAY:	24 x 2 LCD dot matrix with backlight; 24x2 Vacuum Fluorescent display optional.
ADC/DAC RESOLUTION:	12 bits (0.025%).
COMMUNICATION STANDARD:	RS-232 9600 baud rate, 8 bits, two stop bits, no parity (8,2.N).
OPTIONAL:	Ethernet TCP/IP. (HTML Server or TELNET Console).
DIMENSIONS:	Length: 7.75" (19.5 cm), width: 6.75" (17 cm), height: 4.5" (11cm).
WEIGHT:	4.5 lbs (2 kg).
INTERFACE CABLE:	Flat cable with male 15-pin “D” connector and female 15-pin “D” connector on the ends is standard. Optional round shielded cable is available with male/female 15-pin “D” connector ends. [Cable length may not exceed 9.5 feet (3 meters)].
DATA PORT AND RELAY CABLE:	Optional shielded cable with male 25-pin “D” connector to connect to command module data and relay ports. [Cable length may not exceed 9.5 feet (3 meters)].

SDPROC	MODEL

CHANNELS	
1	
2	
3	
4	

CONFIGURATION	
A	AFC
D	DFC
G	GFM /GFC
C	CUSTOM

DIGITAL INTERFACE	
1	RS232
2	RS232 Ethernet

AC INPUT VOLTAGE	
NA	100-240VAC North America
EU	100-240VAC Europe
AU	100-240VAC Australia
UK	100-240VAC United Kingdom

DISPLAY	
L	LCD
V	VFD

SDPROC	—	4	A	2	—	NA	L

EXAMPLE: SDPROC-4A2-NAL

Smart Digital Command Module, 4-Channel, AFC configuration, RS232 with Ethernet, 100-240 VAC North America plug, LCD display.