

Overview

The SMC™ Flex are a family of devices built, sold, and serviced by Allen-Bradley. Refer to [Figure 2745 - 1](#). The SMC™ Flex has an optional built-in Protocol 1 (P1) communication driver, FLN connection, and point database allowing their controllers to coexist on an APOGEE network with other FLN devices.

An Allen-Bradley representative is responsible for proper configuration of the Soft starter for its primary application, while a Siemens Building Technologies representative is responsible for field panel programming, to make use of the drive's functionality in the building automation system. As such, there must be coordination between the Allen-Bradley and Siemens Building Technologies representatives to ensure that programming of the SMC™ Flex is consistent with requirements for field panel programming.

This document describes how the SMC™ Flex can be accessed through a field panel and how it can be used as a part of a larger control scheme.



Figure 2745 - 1. Allen-Bradley SMC™ Flex, Smart Motor Controllers.

Hardware Inputs and Outputs

Contact a Allen-Bradley representative for a complete list of hardware inputs and outputs. Selected I/O to the SMC™ Flex can be accessed from the field panel.

Point Database

[Table 2745 - 2](#) presents the point database information for Application 2745. For complete descriptions of these points and more information on installation, start-up and programming, refer to Allen-Bradley SMC™ Flex *Technical/Owner's Manual* (150-UM008x-EN-P).

Ordering Notes

Contact a Allen-Bradley representative for part numbers and ordering information.

Using the SMC™ Flex

The SMC™ Flex controls the starting and stopping of loads such as fans, pumps, and other equipment. The following strategies achieve a required control sequence. The field panel commands other tasks and functions specific to the SMC™ Flex.

A Siemens Building Technologies, Inc. representative must communicate all control requirements to a factory trained Allen-Bradley representative before setting up the SMC™ Flex. The Allen-Bradley representative must implement these strategies, tasks, and functions prior to setting up the SMC™ Flex.

Strategies

Controlling the Soft starter – The SMC™ Flex offers a several ways of controlling the Soft starter by using subpoints such as RUN ENABLE, CMD.RUN.STOP and so on. There are also sub points to be used for configure the operational state of the Soft starter.

Soft starter Status – The SMC™ Flex offers two ways of supplying the Soft starter status information. One way is the more common way by using subpoints such as READY, RUN.STOP.MON and so on. The second way is a more sophisticated way and is a direct interface to the Soft starter and corporates sub points such as LOGIC STS HI and LOGIC STS LO.

The LOGIC STS LO and LOGIC STS HI are both 8-bits points so these points are internally joined together to make the whole 16-bit status word. Since LOGIC STS LO only gets updated when LOGIC STS HI is read you must read LOGIC STS HI prior reading LOGIC STS LO to maintain data integrity of the status word.

NOTE: The points used for the more common way of getting the status information from the Soft starter are members of the internal logical status word by representing single individual bits.

Refer to [Table 2745 -1](#) for more available status information.

Other Functionality

Each of the following functions must be enabled during start-up of the SMC™ Flex.

Parameter Access – Configurable points USER IN and PARAM IN are points where any parameter in the Soft starter can be monitored. The USER IN shows only 15-bit values so only 16-bit Drive parameters can be used (Only values between 0 - 32767 would be used). The PARAM IN points is used for configuring which parameter is to be monitored. The value ends up in the USER IN point. Configurable Points USER OUT and PARAM OUT are points where write access to any parameter in the Soft starter is possible. But due to the 15-bit limitation only 16-bit Drive parameters should be accessed.

Example – For a Soft starter, writing the value of '1' into PARAM IN point would give us the Voltage of Phase AB in USER IN point. Writing the value of '33' in PARAM OUT and the value of '60' in USER OUT would give us a 'Stop Time' of 60 seconds.



CAUTION:

Dangerous operation may be a result of using none 16-bit Drive parameters with the configurable points. Refer to the Drive user's manual for information about Drive parameter sizes.

Datalinks – Datalink is a fast access method for Drive Parameters. They may be enabled from the Soft starter side and are allocated during Soft starter startup. DLNK A1 OUT to DLNK D2 OUT is when enabled and configured in the Soft starter showing the Datalink Out A1 to D2 parameters from the Soft starter. DLNK A1 IN to DLNK D2 IN are when enabled and configured use to send Datalink In A1 to D2 parameter values to the Soft starter.

NOTE – The SMC™ Flex only supports 16-bit Datalink values.

Example – For a Soft starter enabling Datalink A for the adapter and configuring Data Out A1 in the Soft starter to '1' will give us the Soft starter Parameter 1 – Voltage Phase AB at the DLNK A1 OUT point. Enabling Datalink B2 for the adapter and configuring Data In B2 to '33' in the Soft starter will transfer the value of the DLNK IN B2 point value to Soft starter parameter 33 – 'Stop Time' when accessed.

Reading and resetting faults – The points OK.FAULT and RESET FAULT is used for monitoring fault conditions and to clear them. The Soft starter's status word can also be used.

Loss-of-communications – The Soft starter's loss-of-communications timeout and response must be programmed by the Allen-bradley representative. Loss-of-communications is assumed when the Soft starter no longer receives a Poll-for-COV network command from the field panel. The amount of time allowed between Poll-for-COV commands is configurable from 0 (TIMEOUT-DISABLED) to 180 seconds. To change the network timeout value the NET TIMEOUT parameter in the 20-COMM-H card must be modified.

Five different responses to loss-of-communications with the field panel are available and are summarized as follows:

- **Fault** – Soft starter faults and coasts to a stop. Communications must be re-established and the fault must be reset (RESET FAULT) before Soft starter can be started.
- **Stop** – Normal stop of the Soft starter. Control of the Soft starter is possible when communication is re-established.
- **Zero Data** – Sends zero data to the Soft starter. Reference field and Datalinks are all zero. Control of the Soft starter will be possible when communication is re-established.
- **Hold Last** – Soft starter continues to run in last mode and speed commanded from the Field panel. Safety must be considered since only the Soft starter's local keypad STOP/RESET button or interlocks (Function Loss) contacts stop the SMC when network communications is lost.
- **Send Flt Cfg** – Sends configurable fault data to the Soft starter. The configuration is manageable through the SMC™ Flex adapter parameters.
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Address limitations – CTRL ADDRESS (Point 1) holds the control address of the adapter. The default value for this point is 99. The rotary switches mounted on the adapter card configures what control address to be used by the adapter. When setting the rotary switches to '00' the adapter fetches the control address from the Soft starter adapter parameter 3 'Net Addr Cfg'. The current control address is shown in adapter parameter 4 'Net Addr Act'. These adapter parameters can be shown and accessed by either an external HIM display or by the Drive Explorer tool.

Table 2745 - 1. SMC™ Flex Status Word.

Bit	Function	Command
0	Enabled	0 = No Control Power 1 = Control Power Applied
1	Running	0 = Power not Applied to motrt 1 = Power Applied to Motor
2	Phasing	0 = CBA Phasing 1 = ABC Phasing
3	Phasing Active	0 = No valid 3 phase detected 1 = 3 phase is Valid
4	Starting (Accel)	0 = Not performaing a Start Manouver 1 = Performing a Start Manouver
5	Stopping (Decel)	0 = Not performing a Stop Manouver 1 = Performing a Stop Manouver
6	Alarm	0 = No Alarm Present 1 = Alarm Present
7	Fault	0 = No Fault Condition 1 = Fault Condition Exists
8	At Speed	0 = Not Full Voltage Applied 1 = Full Voltage Applied
9	Start / Isolation	0 = Start/Isolation Contactor Disabled 1 = Start/Isolation Contactor Enabled
10	Bypass	0 = External Bypass Contactor Disabled 1 = External Bypass Contactor Enabled
11	Ready	0 = Not Ready 1 = Ready
12	Option 1 Input	0 = Input Inactive 1 = Input Active
13	Option 2 Input	0 = Input Inactive 1 = Input Active
14	Not Used	-
15	Not Used	-

Table 2745 - 2. Point Database for Application 2745.

Point Number	Point Type	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	LAO	CTLR ADDRESS	99	–	1	0	–	–
02	LAO	APPLICATION	2745	–	–	–	–	–
{04}	LAI	PCT OUTPUT	0	PCT	0.1	0	–	–
{06}	LAI	CURRENT	0	AMPS(A)	0.1	0	–	–
{08}	LAI	POWER	0	KW	0.1	0	–	–
{10}	LAI	DRIVE KWH	0	KWH	1	0	–	–
{12}	LAI	RUN TIME	0	HRS	0.1	0	–	–
{14}	LAI	VOLTS PH.AB	0	VOLTS	1	0	–	–
{15}	LAI	VOLTS PH.BC	0	VOLTS	1	0	–	–
{16}	LAI	VOLTS PH.CA	0	VOLTS	1	0	–	–
{17}	LAI	CURRENT PH.A	0	AMPS	0.1	0	–	–
{18}	LAI	CURRENT PH.B	0	AMPS	0.1	0	–	–
{19}	LAI	CURRENT PH.C	0	AMPS	0.1	0	–	–
{20}	LAO	OVRD TIME	1	HRS	–	–	–	–
{23}	LDI	RUN.STOP MON	STOP	–			RUN	STOP
{24}	LDO	CMD RUN.STOP	STOP	–			START	STOP
{25}	LDI	READY	NOTRDY	–			READY	NOTRDY
{26}	LDO	RUN ENABLE	STOP	–			ENABLE	STOP
{29}	LDO	DAY.NIGHT	DAY	–			NIGHT	DAY
{30}	LDO	SLOW.SPD.SEL	SS.LO	–			SS.LO	SS.HI
{31}	LDO	SLOW.SPD.DIR	SS.FWD	–			SS.FWD	SS.REV
{32}	LAO	SLOW.ACL.CUR	0	PCT	1	0	–	–

- Points not listed are not used in this application.
- A single value in a column means that the value is the same in English units and in SI units.
- Point numbers that appear in brackets { } may be unbundled at the field panel.

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{33}	LAO	SLOW.RUN.CUR	0	PCT	1	0	–	–
36	LAO	PARAM IN	0	–	1	0	–	–
{37}	LAI	USER IN	0	–	1	0	–	–
38	LAO	PARAM OUT	0	–	1	0	–	–
39	LAO	USER OUT	0	–	1	0	–	–
{40}	LAO	START MODE2	0	–	1	0	–	–
{41}	LAO	RAMP TIME2	0	SECS	1	0	–	–
{42}	LAO	INIT TORQUE2	0	PCT	1	0	–	–
{44}	LAI	DLNK A1 OUT	0	–	1	0	–	–
{46}	LAI	DLNK A2 OUT	0	–	1	0	–	–
{48}	LAI	DLNK B1 OUT	0	–	1	0	–	–
{50}	LAI	DLNK B2 OUT	0	–	1	0	–	–
{52}	LAI	DLNK C1 OUT	0	–	1	0	–	–
{54}	LAI	DLNK C2 OUT	0	–	1	0	–	–
{56}	LAI	DLNK D1 OUT	0	–	1	0	–	–
{58}	LAI	DLNK D2 OUT	0	–	1	0	–	–
62	LAO	DLNK A1 IN	0	–	1	0	–	–
64	LAO	DLNK A2 IN	0	–	1	0	–	–
66	LAO	DLNK B1 IN	0	–	1	0	–	–
68	LAO	DLNK B2 IN	0	–	1	0	–	–
70	LAO	DLNK C1 IN	0	–	1	0	–	–
72	LAO	DLNK C2 IN	0	–	1	0	–	–
74	LAO	DLNK D1 IN	0	–	1	0	–	–
76	LAO	DLNK D2 IN	0	–	1	0	–	–
{79}	LAI	SMC OPTION	0	–	1	0	–	–
{80}	LDO	MOTOR CONN	LINE	–			DELTA	LINE
{81}	LAO	LINE VOLTAGE	0	VOLTS	1	0	–	–

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{82}	LAO	START MODE	0	–	1	0	–	–
{83}	LAO	RAMP TIME	0	SECS	1	0	–	–
{84}	LAO	INIT TORQUE	0	PCT	1	0	–	–
{85}	LAO	CUR.LMT.VAL	0	PCT	1	0	–	–
{86}	LAO	KICKST.TIME	0	SECS	0.1	0	–	–
{87}	LAO	KICKST.LVL	0	PCT	1	0	–	–
{88}	LAO	OPT2.INPUT	0	–	1	0	–	–
{89}	LAO	STOP MODE	0	–	1	0	–	–
{90}	LAO	STOP TIME	0	SECS	1	0	–	–
{91}	LAO	BRAKE CURRNT	0	PCT	1	0	–	–
{92}	LAO	STOP CURRNT	0	PCT	1	0	–	–
{93}	LDI	OK.FAULT	OK	–			FAULT	OK
{94}	LDO	RESET FAULT	NORMAL	–			RESET	NORMAL
{95}	LAI	LOGIC STS LO	0	–	1	0	–	–
{96}	LAI	LOGIC STS HI	0	–	1	0	–	–
{99}	LAO	ERROR STATUS	0	–	1	0	–	–

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