Technical Note 096

E-Clipse bypass configuration for GP1

Siemens FLN support

The purpose of Technical Note 096 is to provide guidance for the configuration of the ACH580-01 and ACH580-31 drive with an E-Clipse (electronic bypass) package to utilize the GP1 fieldbus. The following topics will provide guidance on how to implement the GP1 fieldbus in support of a Siemens FLN network. This document will refer to the drive as an ACH580 drive and the electronic bypass (RBCU) unit as an E-Clipse.

Topics:

1. GP1 introduction & ACH580 E-Clipse support of FLN
2. EIA-485 network wiring configuration for ACH580 drive and E-Clipse
3. Programming of the E-Clipse to support FLN communication
4. Point support differences between ACH550 and ACH580 drive and E-Clipse
5. FLN point support for the ACH580 drive
6. FLN point support for the ACH580 E-Clipse

Topic 1 - GP1 introduction & ACH580 support of FLN
The ACH580-01 E-Clipse and ACH580-31 E-Clipse includes the GP1 fieldbus. This generic protocol will allow the ACH580 drive and E-Clipse to communicate on a Siemens FLN network.

Just a few points on why we need to do this:

1. Siemens is moving away from the FLN protocol and has stopped issuing new application numbers for new products, such as the ACH580.
2. There is a significant installation base of older drives on existing FLN networks. GP1 allows the ACH580 to replace those drives.

The GP1 embedded fieldbus connection to the ACH580 drive and E-Clipse bypass is based on an industry standard RS-485 physical interface. For ease of retrofit, the ACH580 uses the same interface (Siemens 2734 application number for the drive and Siemens 2737 application number for the E-Clipse) as the ACH550. The ACH580 supports the majority of the FLN features that were previously supported in the ACH550. The points list for both the ACH580 and its E-Clipse bypass are included in topics 5 & 6 of this document.

Topic 2 - EIA-485 network wiring configuration for the E-Clipse bypass

All communications wiring for GP1 support for the ACH580 drive and E-Clipse is done at the RBCU.

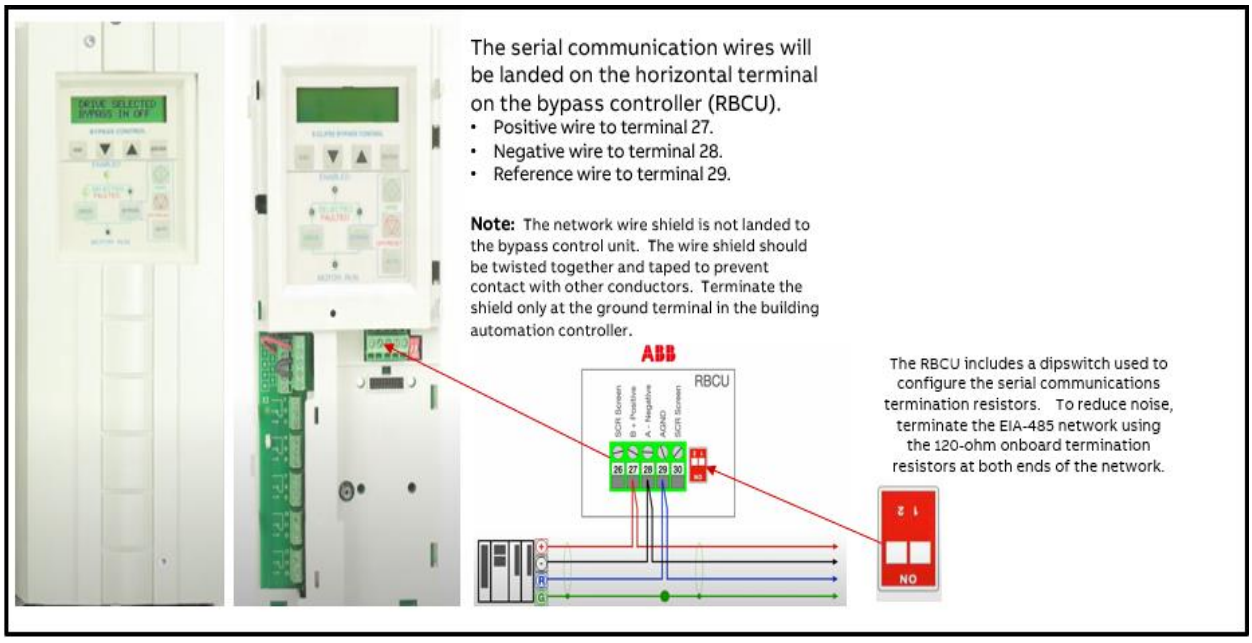


Figure 1 EIA-485 network wiring configuration for the E-Clipse bypass.

Topic 3 - Programming of E-Clipse bypass

All programming for GP1 for FLN support for an ACH580 drive with an E-Clipse bypass is programmed at the E-Clipse bypass control panel.

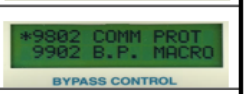
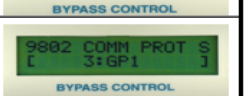
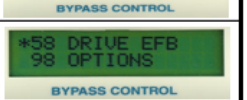
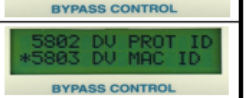
E-Clipse bypass control panel	
-Use the down arrow to the parameter list menu.	
Setting up Comms -Navigate to group 98 OPTIONS.	
Selecting Protocol -Navigate to 9802 COMM PROT. (Brackets will indicate values can be changed.)	
Selecting GP1 -Select option 3:GP1	
Setting Node ID -Navigate to group 58 DRIVE EFB.	
-Navigate to 5803 DV MAC ID and assign node ID value.	
Setting Baud Rate -Navigate to 5804 BAUD RATE and assign value. EFB BAUD RATE Defines the communication speed of the EIA 485 link in kbits per second (kbits/s). Options – 4.8 kbits/s or 9.6 kbits/s	

Figure 2 Programming of the E-Clipse bypass to support FLN network communication using GP1

Control over the FLN Network

In the typical FLN network it is not necessary to modify any other parameters in the ACH580 Drive or E-Clipse to be able to gather data from either the ACH580 drive or the E-Clipse bypass. If the drive was not available (failed), the points listed in this document for the bypass would be available to the FLN network. The following parameters are only to be modified if there is the need to start/stop the drive using the FLN network.

For run/stop over the FLN network for an ACH580 drive:

- E-Clipse bypass parameter 1601 must be set to 2: COMM
- To establish the frequency reference over the FLN network, the ACH580 drive parameter 28.11 must be set to EFB 1.

For run/stop over the FLN network with E-Clipse to run the motor across the line:

- E-Clipse bypass parameter 1601 must be set to 2: COMM.
- E-Clipse bypass parameter 1625 must be set to 1: SYSTEM.
- E-Clipse bypass parameter 5003 must have a node ID assigned to it.

Topic 4 - Differences between FLN point support between ACH550 and ACH580 drive and E-Clipse bypass

Topic 5 & 6 includes a list of all points FLN points supported by the ACH580 drive as well as the E-Clipse bypass. There are a few points that lack the functionality of the ACH550 and always report “0” in the ACH580 drive:

- Point 18 – Revolution counter (not supported in ACH580)
- Point 39 – Reference 2 source (only Reference 1 source bit is supported in ACH580)
- Point 48 – Maintenance trigger (not supported in ACH580)
- Point 88 – Alarm word 1 (not supported in ACH580)
- Point 89 – Alarm word 2 (not supported in ACH580)

There are a few points that lack the functionality of the 550 E-Clipse bypass and always report “0” in the ACH580 E-Clipse bypass:

- Point 48 – Maintenance trigger (not supported in 580 E-Clipse)
- Point 88 – Alarm word 1 (not supported in 580 E-Clipse)
- Point 89 – Alarm word 2 (not supported in 580 E-Clipse)

Topic 5 - FLN point support for the ACH580 drive

The following table lists the point database for ACH580 GP1 embedded field bus. (FLN: ACH550 application 2734)

ACH580 drive FLN points

Point		Subpoint Name	Factory Default	Engr. Units	Slope	Intercept	On Text	Off Text
#	Type		(SI Units)					
01	LAO	CTLR ADDRESS	99	-	1	0	-	-
02	LAO	APPLICATION	2734	-	1		-	-
{03}	LAI	FREQ OUTPUT	0	Hz	0.1	0	-	-
{04}	LAI	PCT OUTPUT	0	PCT	0.1	0	-	-
{05}	LAI	SPEED	0	RPM	1	0	-	-
{06}	LAI	CURRENT	0	A	0.1		-	-
{07}	LAI	TORQUE	0	PCT	0.1	-200	-	-
{08} *	LAI	POWER	0 (0)	HP (KW)	0.134 (0.1)	0	-	-
{09} *	LAI	DRIVE TEMP	77 (25)	° F (° C)	0.18 (0.1)	32 (0)	-	-
{10}	LAI	DRIVE KWH	0	KWH	1		-	-
{11}	LAI	DRIVE MWH	0	MWH	1		-	-
{12}	LAI	RUN TIME	0	HRS	1		-	-
{13}	LAI	DC BUS VOLT	0	V	1		-	-
{14}	LAI	OUTPUT VOLT	0	V	1		-	-
{15}	LAI	PRC PID FBCK	0	PCT	0.1		-	-
{16}	LAI	PRC PID DEV	0	PCT	0.1		-	-
{17} *	LAI	MOTOR TEMP	77(25)	° F (° C)	1.8 (1)	32 0	-	-
{18}	LAI	MREV COUNTER	0	**NOT SUPPORTED FOR ACH580**				
20	LAO	OVRD TIME	1	hrs	1	0	-	-
{21}	LDI	FWD.REV ACT	FWD	-	1	0	REV	FWD
{22}	LDO	FWD.REV CMD	FWD	-	1	0	REV	FWD
{23}	LDI	RUN.STOP ACT	STOP	-	1	0	RUN	STOP
{24}	LDO	RUN.STOP CMD	STOP	-	1	0	RUN	STOP
{25}	LDI	EXT1.2 ACT	EXT1	-	1	0	EXT2	EXT1
{26}	LDO	EXT1.2 CMD	EXT1	-	1	0	EXT2	EXT1
{27}	LDI	DRIVE READY	NOTRDY	-	1	0	READY	NOTRDY
{28}	LDI	AT SETPOINT	NO	-	1	0	YES	NO
30	LAO	CURRENT LIM	0	A	0.1	0	-	-

ACH580 drive FLN points

Point		Subpoint Name	Factory Default	Engr. Units	Slope	Intercept	On Text	Off Text
#	Type		(SI Units)					
31	LAO	ACCEL TIME 1	300	sec	0.1	0	-	-
32	LAO	DECEL TIME 1	300	sec	0.1	0	-	-
{33}	LDI	HANDAUTO ACT	AUTO	-	1	0	HAND	AUTO
{34}	LDI	ENA.DIS ACT	DISABL	-	1	0	ENABLE	DISABL
{35}	LDO	ENA.DIS CMD	DISABL	-	1	0	ENABLE	DISABL
{36}	LDI	FLN LOC ACT	AUTO	-	1	0	FLN	AUTO
{37}	LDI	FLN CTL SRC	NO	-	1	0	YES	NO
{38}	LDI	FLN REF1 SRC	NO	-	1	0	YES	NO
{39}	LDI	FLN REF2 SRC	NO	**NOT SUPPORTED FOR ACH580**				
{40}	LDO	RO 1 COMMAND	OFF	-	1	0	ON	OFF
{41}	LDO	RO 2 COMMAND	OFF	-	1	0	ON	OFF
{42}	LDO	RO 3 COMMAND	OFF	-	1	0	ON	OFF
{43}	LDO	RO 4 COMMAND	OFF	-	1	0	ON	OFF
{44}	LDO	RO 5 COMMAND	OFF	-	1	0	ON	OFF
{45}	LDO	RO 6 COMMAND	OFF	-	1	0	ON	OFF
{46}	LAO	AO 1 COMMAND	PCT	PCT	0.1	0	-	-
{47}	LAO	AO 2 COMMAND	PCT	PCT	0.1	0	-	-
48	LDO	RST RUN TIME	NO	**NOT SUPPORTED FOR ACH580**				
49	LDO	RESET KWH	NO	-	1	0	RESET	NO
50	LAO	PRC PID GAIN	10	PCT	0.1	0	-	-
51	LAO	PRC PID ITIM	600	SEC	0.1	0	-	-
52	LAO	PRC PID DTIM	0	SEC	0.1	0	-	-
53	LAO	PRC PID DFIL	10	SEC	0.1	0	-	-
54	LDO	PRC PID SEL	SET1	-	1	0	SET2	SET1
55	LAO	EXT PID GAIN	10	PCT	0.1	0	-	-
56	LAO	EXT PID ITIM	600	SEC	0.1	0	-	-
57	LAO	EXT PID DTIM	0	SEC	0.1	0	-	-
58	LAO	EXT PID DFIL	10	SEC	0.1	0	-	-
59	LDO	LOCK PANEL	UNLOCK	-	1	0	LOCK	UNLOCK
{60}	LAO	INPUT REF 1	0	PCT	0.1	0	-	-
{61}	LAO	INPUT REF 2	0	PCT	0.1	0	-	-
{62}	LAO	EXT PID STPT	0	PCT	0.1	0	-	-
{63}	LAI	EXT PID FBCK	0	PCT	0.1	0	-	-
{64}	LAI	EXT PID DEV	0	PCT	0.1	0	-	-
66	LDO	SPD OUT MIN	0	PCT	0.1	0	-	-
67	LDO	SPD OUT MAX	1000	PCT	0.1	0	-	-
{68}	LDO	FLN LOC CTL	AUTO	-	1	0	FLN	AUTO
{69}	LDO	FLN LOC REF	AUTO	-	1	0	FLN	AUTO

ACH580 drive FLN points

Point		Factory Default	Engr. Units	Slope	Intercept	On Text	Off Text
#		(SI Units)					
{70}	DI 1 ACTUAL	OFF	-	1	0	ON	OFF
{71}	DI 2 ACTUAL	OFF	-	1	0	ON	OFF
{72}	DI 3 ACTUAL	OFF	-	1	0	ON	OFF
{73}	DI 4 ACTUAL	OFF	-	1	0	ON	OFF
{74}	DI 5 ACTUAL	OFF	-	1	0	ON	OFF
{75}	DI 6 ACTUAL	OFF	-	1	0	ON	OFF
{76}	RO 1 ACTUAL	OFF	-	1	0	ON	OFF
{77}	RO 2 ACTUAL	OFF	-	1	0	ON	OFF
{78}	RO 3 ACTUAL	OFF	-	1	0	ON	OFF
{79}	RO 4 ACTUAL	OFF	-	1	0	ON	OFF
{80}	RO 5 ACTUAL	OFF	-	1	0	ON	OFF
{81}	RO 6 ACTUAL	OFF	-	1	0	ON	OFF
{82}	AI 1 ACTUAL	0	PCT	0.1	0	-	-
{83}	AI 2 ACTUAL	0	PCT	0.1	0	-	-
{84}	AO 1 ACTUAL	0	MA	0.1	0	-	-
{85}	AO 2 ACTUAL	0	MA	0.1	0	-	-
{86}	OK.ALARM	OK	-	1	0	ALARM	OK
{87}	OK.MAINT	OK	-	1	0	MAINT	OK
{88}	ALARM WORD 1	-	**NOT SUPPORTED FOR ACH580**				
{89}	ALARM WORD 2	-	**NOT SUPPORTED FOR ACH580**				
{90}	LAST FAULT	-	-	1	0	-	-
{91}	PREV FAULT 1	-	-	1	0	-	-
{92}	PREV FAULT 2	-	-	1	0	-	-
{93}	OK.FAULT	OK	-	1	0	FAULT	OK
{94}	RESET FAULT	NO	-	1	0	RESET	NO
{95}	MBOX PARAM	-	-	1	0	-	-
{96}	MBOX DATA	-	-	1	0	-	-
{98}	MBOX WRITE	DONE	-	1	0	WRITE	DONE
{99}	ERROR STATUS	-	-	1	0	-	-

a. Points not listed are not used in this application.
b. A single value in a column means that the value is the same in English units and in SI units.
c. Point numbers that appear in brackets {} may be unbundled at the field panel.
d. Point numbers with *, ACH580 drive parameter 96.16 bit 0 determines if this value is metric or imperial.

Topic 6 - FLN point support for the ACH580 E-Clipse bypass

The following table lists the point database for E-Clipse GP1 embedded field bus. (FLN: ACH550 application 2734)

E-Clipse FLN points

Point		Subpoint Name	Factory Default	Engr. Units	Slope	Intercept	On Text	Off Text
#	Type		(SI Units)					
1	LAO	CTLR ADDRESS	2	-	1	0	-	-
2	LAO	APPLICATION 2737	2734	-	1	0	-	-
5	LAI	INPUT VOLT	0	V	1	0	-	-
{06}	LAI	CURRENT	0	A	0.1	0	-	-
{07}	LAI	SYSUNDRLOAD	NO	-	1	0	[YES]	[NO]
9*	LAI	PCB TEMP	77 (25)	° F (° C)	0.18 (0.1)	33 (0)	-	-
10	LAI	KW HOURS	0	KWH	1	0		
12	LAI	RUN TIME	0	HRS	1	0	-	-
13	LAI	A.B. VOLT	0	V	1	0		
14	LAI	B.C. VOLT	0	V	1	0	-	-
15	LAI	C.A. VOLT	0	V	1	0	-	-
20	LAO	OVRD TIME	1	HRS	1	0	-	-
{23}	LDI	MTR RUNNING	STOP	-	1	0	[RUN]	[STOP]
{24}	LDO	RUN.STOP CMD	STOP	-	1	0	[RUN]	[STOP]
{25}	LDI	OVERRIDE ACT	OFF	-	1	0	[ON]	[OFF]
{26}	LDO	OVERRIDE CMD	OFF	-	1	0	[ON]	[OFF]
{27}	LDI	SYSTEM READY	NOT READY	-	1	0	[READY]	[NOT READY]
{28}	LDI	SYS STARTED	NO	-	1	0	[YES]	[NO]
{29}	LDO	DAY.NIGHTDAY	DAY	-	1	0	[NIGHT]	[DAY]
30	LAO	BYP RUN DLY	0	SEC	1	0	-	-
{31}	LAI	BYPASSMODE	0	-	1	0	-	-
{32}	LDI	DRIVE.BYPASSDRIVE	DRIVE	-	1	0	[BYPASS]	[DRIVE]
{33}	LDI	BYP RUNNING	NO	-	1	0	[YES]	[NO]
{34}	LDI	RUN ENA ACT	DISABL	-	1	0	[ENABLE]	[DISABL]
{35}	LDO	RUN ENA CMD	DISABL	-	1	0	[ENABLE]	[DISABL]
{36}	LDI	FLN LOC ACT	AUTO	-	1	0	[FLN]	[AUTO]
{37}	LDI	FLN CTL SRC	NO	-	1	0	[YES]	[NO]
{40}	LDO	RO 1 COMMAND	OFF	-	1	0	[ON]	[OFF]
{41}	LDO	RO 2 COMMAND	OFF	-	1	0	[ON]	[OFF]
{42}	LDO	RO 3 COMMAND	OFF	-	1	0	[ON]	[OFF]

E-Clipse FLN points

Point		Subpoint Name	Factory Default	Engr. Units	Slope	Intercept	On Text	Off Text
#	Type		(SI Units)					
{43}	LDO	RO 4 COMMAND	OFF	-	1	0	ON	OFF
{44}	LDO	RO 5 COMMAND	OFF	-	1	0	ON	OFF
{48}	LDO	RST RUN TIME	NO	**NOT SUPPORTED FOR E-CLIPSE**				
{49}	LDO	RESET KWH 0	0	-	1	0	-	-
{50}	LDO	START ENA 1	DISABL	-	1	0	[ENABLE]	[DISABL]
{51}	LDO	START ENA 2	DISABL	-	1	0	[ENABLE]	[DISABL]
{52}	LDO	START ENA 3	DISABL	-	1	0	[ENABLE]	[DISABL]
{53}	LDO	START ENA 4	DISABL	-	1	0	[ENABLE]	[DISABL]
{59}	LDO	LOCK PANEL O	0PEN	-	1	0	[LOCK]	[UNLOCK]
{68}	LDO	FLN LOC CTL	AUTO	-	1	0	[FLN]	[AUTO]
{70}	LDI	DI 1 ACTUAL	OFF	-	1	0	[ON]	[OFF]
{71}	LDI	DI 2 ACTUAL	OFF	-	1	0	[ON]	[OFF]
{72}	LDI	DI 3 ACTUAL	OFF	-	1	0	[ON]	[OFF]
{73}	LDI	DI 4 ACTUAL	OFF	PCT	0.1	0	[ON]	[OFF]
{74}	LDI	DI 5 ACTUAL	OFF	PCT	0.1	0	[ON]	[OFF]
{75}	LDI	DI 6 ACTUAL	OFF	MA	0.1	0	[ON]	[OFF]
{76}	LDI	RO 1 ACTUAL	OFF	MA	0.1	0	[ON]	[OFF]
{77}	LDI	RO 2 ACTUAL	OFF	-	1	0	[ON]	[OFF]
{78}	LDI	RO 3 ACTUAL	OFF	-	1	0	[ON]	[OFF]
{79}	LDI	RO 4 ACTUAL	OFF	-	1	0	[ON]	[OFF]
{80}	LDI	RO 5 ACTUAL	OFF				[ON]	[OFF]
{86}	LDI	BYPASS ALARM	OK				[ALARM]	[OK]
{88}	LAI	ALARM WORD 1	NO	**NOT SUPPORTED FOR E-CLIPSE**				
{89}	LAI	ALARM WORD 2	NO	**NOT SUPPORTED FOR E-CLIPSE**				
{90}	LAI	LAST FAULT	-	-	1	0	-	-
{93}	LDI	OK.FAULT BYP	OK	-	1	0	FAULT	OK
{94}	LDO	RESET FAULT	NO	-	1	0	RESET	NO
{99}	LAO	ERROR STATUS	-	-	1	0	-	-

a. Points not listed are not used in this application.
b. A single value in a column means that the value is the same in English units and in SI units.
c. Point numbers that appear in brackets {} may be unbundled at the field panel.
d. Point numbers with *, ACH580 drive parameter 96.16 bit 0 determines if this value is metric or imperial.

Conclusion

This document provides the information needed to support the wiring and programming of the ACH580 E-Clipse bypass package using native fieldbus GP1 for the support of an existing Siemens FLN network. The ACH580 drive and E-Clipse bypass support this through the same interface (Siemens 2734 application number for the drive and Siemens 2737 application number for the E-Clipse) as the ACH550.