SmartGen

MAKING CONTROL SMARTER

SG81/SG81Z

PROTOCOL CONVERSION MODULE

COMMUNICATION PROTOCOL

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Table 1 Software Version

Date	Version	Content
2025-08-18	V1.0	Original release.

CONTENTS

1 DESCRIPTION

This protocol describes the protocol conversion module's CAN transmission and response command format, and the definition of internal message & data for the third-party to develop and use.

External devices can be considered as the communication initiators (referred to as the host). They send read and write commands via the CAN port to receive or write information from/to various modules. The initiation of communication is random. Each module acts as responders in the communication (referred to as the slaves). They do not initiate communication on the CAN bus unless they receive read or write commands. However, upon receiving a command, they must execute the corresponding operation and respond according to the protocol.

Frame type: extended frame;

Frame format: data frame;

Baud rate: 250kbps;

Byte order: Little-endian.

2 CAN DATA TRANSMISSION AND RESPONSE

	Frame ID	Data Field		
Start Command	0x1E350001	Default: 0x00		
Slave Response	0x151E2E01	Succeed Byte0=0xFF	Fail Byte0=0x00	Byte1-Byte7 Default: 0x00

	Frame ID	Data Field		
Stop Command	0x1E350002	Default: 0x00		
Slave Response	0x151E2E02	Succeed Byte0=0xFF	Fail Byte0=0x00	Byte1-Byte7 Default: 0x00

	Frame ID	Data Field		
Close Command	0x1E350003	Default: 0x00		
Slave Response	0x151E2E03	Succeed Byte0=0xFF	Fail Byte0=0x00	Byte1-Byte7 Default: 0x00

	Frame ID	Data Field		
Open Command	0x1E350004	Default: 0x00		
Slave Response	0x151E2E04	Succeed Byte0=0xFF	Fail Byte0=0x00	Byte1-Byte7 Default: 0x00

	Frame ID	Data Field			
Read Command	0x1E350006	Default: 0x00			
Slave	0x151E2606	Running Hours	Running	Running	Start Times

	Frame ID	Data Field			
Response			Minutes	Seconds	
		Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Frame ID	Data Signification			
Read Command	0x1E350007	Default: 0x00			
Slave Response	0x151E2607	Rated Speed	Sensor 2 (*0.1)	Sensor 1 (*0.1)	Sensor 3 (*0.1)
		Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Frame ID	Data Signification			
Read Command	0x1E350008	Default: 0x00			
Slave Response	0x151E2608	Battery Voltage (*0.1)	Charger D+ Voltage (*0.1)	Gen. Frequency (*0.1)	Power Factor (*0.01)
		Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Frame ID	Data Field			
Read Command	0x1E350009	Default: 0x00			
Slave Response	0x151E2609	Gen. UA	Gen. UB	Gen. UC	Engine Running Status
		Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Frame ID	Data Field			
Read Command	0x1E35000A	Default: 0x00			
Slave Response	0x151E260A	Gen. UAB	Gen. UBC	Gen. UCA	Engine Delay
		Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Frame ID	Data Field			
Read Command	0x1E35000B	Default: 0x00			
Slave Response	0x151E260B	Phase A Current (*0.1)	Phase B Current (*0.1)	Phase C Current (*0.1)	Reserved
		Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Frame ID	Data Field	
Read Command	0x1E35000C	Default: 0x00	
Slave Response	0x151E260C	Total Generation (*0.1)	Total Active Power (*0.1)
		Byte0-Byte3	Byte4-Byte7

	Frame ID	Data Field	
Read Command	0x1E35000D	Default: 0x00	
Slave Response	0x151E260D	Total Reactive Power (*0.1)	Total Apparent Power (*0.1)
		Byte0-Byte3	Byte4-Byte7

	Warning Alarm Field			
Read Command 0x1E35001A	Default: 0x00			
Slave Response 0x151E261A	Bit0: Over Speed Warning Bit1: Under Speed Warning Bit2: Loss of Speed Signal Bit3: Gen. Over Frequency Bit4: Gen. Under Frequency Bit5: Gen. Over Voltage Bit6: Gen. Under Voltage Bit7: Gen. Over Current Bit8: Fail to Stop Bit9: Charge Alternator Failure Bit10: Battery Over Voltage Bit11: Battery Under Voltage Bit12: Maintenance Due Warning Bit13: Reverse Power Bit14: Over Power Bit15: ECU	Gen. Loss of Phase Gen. Reverse Phase Sequence Reserved Unbalanced Current Earth Fault Loss of Excitation Fault Reserved Reserved Temp. Sensor Open High Temp. Low Temp. Reserved Oil Pressure Sensor Open Reserved Low Oil Pressure Reserved	Level Sensor Open Reserved Low Level Warning Reserved Flex. Sensor 1 Open Flex. Sensor 1 High Flex. Sensor 1 Low DC Over Voltage Warning Flex. Sensor 2 Open Flex. Sensor 2 High Flex. Sensor 2 Low DC Under Voltage Warning Reserved Reserved Reserved DC Over Current Warning	Input Module 1 Comm. Failure Input Module 1 Exhaust Temp. High Input Module 1 Sensor 15 Open Input Module 1 Sensor 15 High Input Module 1 Sensor 15 Low Input Module 1 Sensor 16 Open Input Module 1 Sensor 16 High Input Module 1 Sensor 16 Low Input Module 1 Sensor 17 Open Input Module 1 Sensor 17 High Input Module 1 Sensor 17 Low Input Module 1 Sensor 18 Open Input Module 1 Sensor 18 High Input Module 1 Sensor 18 Low Input Module 1 Sensor 19 Open Input Module 1 Sensor 19 High
	Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Trip Alarm Field			
Start Command 0x1E35001B	Default: 0x00			
Slave Response 0x151E261B	Bit0: Over Current Trip Bit1: Reserved Bit2: Reverse Power Trip	PLC Function 1 PLC Function 2 PLC Function 3	PLC Function 17 PLC Function 18 PLC Function 19	Exp. Digital Input 11 Exp. Digital Input 12 Exp. Digital Input 13

	Trip Alarm Field			
	Bit3: Over Power Trip Bit4: Input 1 Trip Bit5: Input 2 Trip Bit6: Input 3 Trip Bit7: Input 4 Trip Bit8: Input 5 Trip Bit9: Input 6 Trip Bit10: Input 7 Trip Bit11: Input 8 Trip Bit12: Reserved Bit13: Reserved Bit14: Exp. Digital Input Comm. Failure Bit15: Exp. Digital Output Comm. Failure	PLC Function 4 PLC Function 5 PLC Function 6 PLC Function 7 PLC Function 8 PLC Function 9 PLC Function 10 PLC Function 11 PLC Function 12 PLC Function 13 PLC Function 14 PLC Function 15 PLC Function 16	PLC Function 20 Reserved Reserved Exp. Digital Input 1 Exp. Digital Input 2 Exp. Digital Input 3 Exp. Digital Input 4 Exp. Digital Input 5 Exp. Digital Input 6 Exp. Digital Input 7 Exp. Digital Input 8 Exp. Digital Input 9 Exp. Digital Input 10	Exp. Digital Input 14 Exp. Digital Input 15 Exp. Digital Input 16 DC Over Current Trip DC Over Power Trip Reserved Reserved Reserved Reserved Loss of Excitation Fault Trip Earth Fault Trip Unbalanced Current Trip Reserved
	Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Shutdown Alarm Field			
Start Command 0x1E35001C	Default: 0x00			
Slave Response 0x151E261C	Bit0: Emergency Stop Bit1: Over Speed Shutdown Bit2: Under Speed Shutdown Bit3: Loss of Speed Signal Shutdown Bit4: Gen. Over Frequency Shutdown Bit5: Gen. Under Frequency Shutdown Bit6: Gen. Over Voltage Shutdown Bit7: Gen. Under Voltage Shutdown Bit8: Fail to Start Bit9: Gen. Over Current Shutdown Bit10: Maintenance Due Shutdown Bit11: ECU Shutdown Bit12: Reverse Power Shutdown Bit13: Over Power Shutdown	ECU Comm. Failure Shutdown Reserved Reserved Gen. Phase Sequence Error Shutdown Reserved Unbalanced Current Shutdown Earth Fault Shutdown Loss of Excitation Fault Shutdown Temp. Sensor Open High Temp. Shutdown Reserved DC Over Voltage Shutdown Oil Pressure Sensor Open Reserved Low Oil Pressure Shutdown DC Under Voltage	Level Sensor Open Reserved Reserved DC Over Current Shutdown Flex. Sensor 1 Open Flex. Sensor 1 High Shutdown Flex. Sensor 1 Low Shutdown DC Over Power Shutdown Flex. Sensor 2 Open Flex. Sensor 2 High Shutdown Flex. Sensor 2 Low Shutdown Reserved Reserved Reserved Reserved Reserved	Input Module 1 Comm. Failure Input Module 1 Exhaust Temp. High Input Module 1 Sensor 15 Open Input Module 1 Sensor 15 High Input Module 1 Sensor 15 Low Input Module 1 Sensor 16 Open Input Module 1 Sensor 16 High Input Module 1 Sensor 16 Low Input Module 1 Sensor 17 Open Input Module 1 Sensor 17 High Input Module 1 Sensor 17 Low Input Module 1 Sensor 18 Open

	Shutdown Alarm Field			
	Bit14: High Temp. Input Shutdown Bit15: Low Oil Pressure Input Shutdown	Shutdown		Input Module 1 Sensor 18 High Input Module 1 Sensor 18 Low Input Module 1 Sensor 19 Open Input Module 1 Sensor 19 High
	Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Trip and Stop Field			
Start Command 0x1E35001D	Default: 0x00			
Slave Response 0x151E261D	Bit0: Over Current Trip & Stop Bit1: Maintenance Due Trip & Stop Bit2: Reverse Power Trip & Stop Bit3: Over Power Trip & Stop Bit4: Input 1 Trip & Stop Bit5: Input 2 Trip & Stop Bit6: Input 3 Trip & Stop Bit7: Input 4 Trip & Stop Bit8: Input 5 Trip & Stop Bit9: Input 6 Trip & Stop Bit10: Input 7 Trip & Stop Bit11: Input 8 Trip & Stop Bit12: Reserved Bit13: Reserved Bit14: Exp. Digital Input Comm. Failure Bit15: Exp. Digital Output Comm. Failure	PLC Function 1 PLC Function 2 PLC Function 3 PLC Function 4 PLC Function 5 PLC Function 6 PLC Function 7 PLC Function 8 PLC Function 9 PLC Function 10 PLC Function 11 PLC Function 12 PLC Function 13 PLC Function 14 PLC Function 15 PLC Function 16	PLC Function 17 PLC Function 18 PLC Function 19 PLC Function 20 Reserved Reserved Exp. Digital Input 1 Exp. Digital Input 2 Exp. Digital Input 3 Exp. Digital Input 4 Exp. Digital Input 5 Exp. Digital Input 6 Exp. Digital Input 7 Exp. Digital Input 8 Exp. Digital Input 9 Exp. Digital Input 10	Exp. Digital Input 11 Exp. Digital Input 12 Exp. Digital Input 13 Exp. Digital Input 14 Exp. Digital Input 15 Exp. Digital Input 16 DC Over Current Trip DC Over Power Trip Reserved Reserved Reserved Reserved Loss of Excitation Fault Trip & Stop Earth Fault Trip & Stop Unbalanced Current Trip & Stop Reserved
	Byte0-Byte1	Byte2-Byte3	Byte4-Byte5	Byte6-Byte7

	Frame ID	Data Field		
Clear Command	0x1E35001E	Default: 0x00		
Slave Response	0x151E261E	Clear Successfully	Clear Failed	Byte1-Byte7 Default: 0x00
		Byte0=0x01	Byte0=0x00	