SmartGen

MAKING CONTROL SMARTER

SG485-2CAN

COMMUNICATION INTERFACE CONVERSION MODULE

CANBUS COMMUNICATION PROTOCOL

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Table 1 Version History

Date	Version	Contents
2021-09-02	V1.0	Original release.
2023-08-17	V1.1	1. Add different CAN baud rate and CAN_ID set by DIP switch, CAN_ID can be used to distinguish different genset; 2. Add back data frame of CAN controlled instruction; 3. Update the frame ID composition of the protocol data frame.
2024-08-13	V1.2	Add new control commands (Mains close/open, Remote outputs)

CONTENT

1. DESCRIPTION

This protocol describes the definition of two CAN ports communication protocol of this module in detail, so that user can make data acquisition and execute control command via the protocol.

2. DEFINITION OF PROTOCOL DATA UNIT (PDU)

This protocol uses 29-bit identifier of CAN extended frame, and the communication baud rate can be selected according to the 5-bit and 6- bit of the switch number of DIP switch (00: 250kbit/s 01: 100kbit/s 10: 125kbit/s 11: reserved). CAN_ID (00:0x40 01:0x41 10：0x42 11：0x43) can be set according to the 7- bit and 8- bit of the switch number of DIP switch to distinguish different genset, see Table 2 below.

Table 2 DIP Switch Setting

DIP Switch Setting								
Function	RS485(2) Address			Reserved	CAN Baud Rate		CAN_ID	
DIP Switch No.	1	2	3	4	5	6	7	8
DIP Switch Combination and Corresponding Relationship	000: 1			Reserved	00: 250kbit/s		00: 0x40	
	001: 2							
	010: 3				01: 100kbit/s		01: 0x41	
	011: 4							
	100: 5				10: 125kbit/s		10: 0x42	
	101: 6							
	110: 7				11: reserved		11: 0x43	
	111: 8							

This protocol uses 29-bit identifier of CAN extended frame, and the corresoponding definition of each bit assignment conforms to rules of SAEJ1939-21. Each CAN data frame includes a single protocol data unit (PDU), see Table 3 below.

Table 3 Protocol Data Unit

P	R	DP	PF	PS	SA	DATA
3	1	1	8	8	8	0-64

NOTE1: P represents priority: 0-7. This protocol is set as 6.

NOTE2: R represents reserved bit: standby for later development. This protocol is set as 0.

NOTE3: DP represents data page: used for selecting auxiliary page of parameter group description. This protocol is set as 0.

NOTE4: PF represents PDU format: used for confirming PDU format and corresponding parameter group number of data field.

NOTE5: PS represents purpose site: purpose site for receiving this message. This protocol is set as 0x10.

NOTE6: SA represents source address: source address for sending this message. This protocol can be set to (0-3， 00:0x40 01:0x41 10:0x42 11:0x43) according to the 7-bit and 8-bit selection of DIP switch.

NOTE7: DATA represents data field: if given parameter group data length≤8 bytes, all 8 bytes of data field can be used. If there are less than 8 bytes, the remaining bytes are filled with 0xFF or 0x00.

3. WIRING DIAGRAM

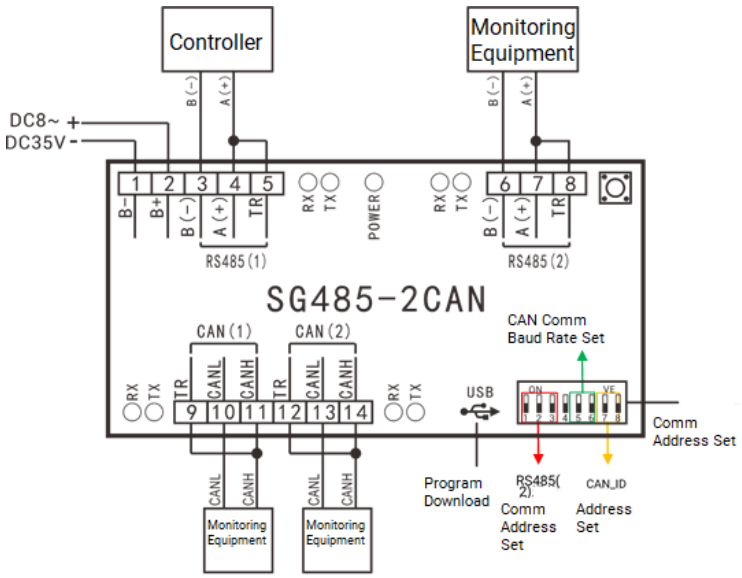

Fig.1 Communication Wiring Diagram

4. DEFINITION OF PROTOCOL FRAME

Module upload information

(1) **formation_1:**【ID: 0x18011000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x01	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Common Alarm	1	0	
	Bit1: Common Shutdown Alarm			
	Bit2: Common Warning Alarm			
	Bit3: Common Trip and Stop Alarm			
	Bit4: Common Open without Stop			
	Bit5: Common Trip and Stop Alarm & Common Shutdown Alarm			
	Bit6: Reserved			
	Bit7: Reserved			
1	Bit0: System in Test Mode	1	0	
	Bit1: System in Auto Mode			

	Bit2: System in Manual Mode			
	Bit3: System in Stop Mode			
	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Reserved			
	Bit7: Reserved			
2	Bit0: Emergency Stop Alarm	1	0	
	Bit1: Overspeed Alarm Shutdown			
	Bit2: Underspeed Alarm Shutdown			
	Bit3: Loss of Speed Signal Alarm			
	Bit4: Gen OverFrequency Shutdown			
	Bit5: Gen Underfrequency Shutdown			
	Bit6: Gen Overvoltage Shutdown			
	Bit7: Gen Undervoltage Shutdown			
3	Bit0: Crank Failure Alarm	1	0	
	Bit1: Gen Overcurrent Shutdown			
	Bit2: Maintenance Due Alarm Shutdown			
	Bit3: ECU Alarm Shutdown			
	Bit4: Reverse Power Alarm Shutdown			
	Bit5: Over Power Alarm Shutdown			
	Bit6: High Temperature IN Alarm Shutdown			
	Bit7: Low Oil Pressure IN Alarm Shutdown			
4	Bit0: ECU Comm. Failure Alarm Shutdown	1	0	
	Bit1: MSC ID Error Alarm Shutdown			
	Bit2: Voltage Bus Error Alarm Shutdown			
	Bit3: Gen Phase Seq. Error Alarm Shutdown			
	Bit4: Voltage Bus Phase Seq. Error Shutdown			
	Bit5: Current Unbalance Alarm Shutdown			
	Bit6: Earth Fault Alarm Shutdown			
	Bit7: Loss of Excitation Fault Alarm Shutdown			
5	Bit0: Temperature Sensor Open	1	0	
	Bit1: High Temp Alarm Shutdown			
	Bit2: Reserved			
	Bit3: Reserved			
	Bit4: Oil Pressure Sensor Open			
	Bit5: Reserved			
	Bit6: Low Oil Pressure Alarm Shutdown			
	Bit7: Reserved			
6	Bit0: Level Sensor Open	1	0	
	Bit1: Reserved			
	Bit2: Reserved			
	Bit3: Reserved			

	Bit4: Aux. Sensor 1 Open			
	Bit5: Aux. 1 High Alarm Shutdown			
	Bit6: Aux. 1 Low Alarm Shutdown			
	Bit7: Reserved			
7	Bit0: Aux. Sensor 2 Open	1	0	
	Bit1: Aux. 2 High Alarm Shutdown			
	Bit2: Aux. 2 Low Alarm Shutdown			
	Bit3: Reserved			
	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Reserved			
	Bit7: Input Module 2 Cylinder Temp High			

(2) **formation_2:**【ID: 0x18021000+CAN_ID】

Sender: Module								Receiver: Monitoring Equipment							Frame Format: Extended Data Frame								Send Period: 800ms							
ID																														
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
CODE = 0x18					FID = 0x02								PS = 0x10						SA = CAN ID（0x40/0x41/0x42/0x43）												
Length																														
8																														
Data																														

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Input Module 1 Comm. Failure	1	0	
	Bit1: Input Module 1 Exhaust Temp High			
	Bit2: Input Module 1 Sensor 15 Open			
	Bit3: Input Module 1 Sensor 15 High			
	Bit4: Input Module 1 Sensor 15 Low			
	Bit5: Input Module 1 Sensor 16 Open			
	Bit6: Input Module 1 Sensor 16 High			
	Bit7: Input Module 1 Sensor 16 Low			
1	Bit0: Input Module 1 Sensor 17 Open	1	0	
	Bit1: Input Module 1 Sensor 17 High			
	Bit2: Input Module 1 Sensor 17 Low			
	Bit3: Input Module 1 Sensor 18 Open			
	Bit4: Input Module 1 Sensor 18 High			
	Bit5: Input Module 1 Sensor 18 Low			
	Bit6: Input Module 1 Sensor 19 Open			
	Bit7: Input Module 1 Sensor 19 High			
2	Bit0: Input Module 1 Sensor 19 Low	1	0	
	Bit1: Input Module 1 Sensor 20 Open			
	Bit2: Input Module 1 Sensor 20 High			
	Bit3: Input Module 1 Sensor 20 Low			
	Bit4: Input Module 1 Sensor 21 Open			

	Bit5: Input Module 1 Sensor 21 High			
	Bit6: Input Module 1 Sensor 21 Low			
	Bit7: Input Module 1 Sensor 22 Open			
3	Bit0: Input Module 1 Sensor 22 High	1	0	
	Bit1: Input Module 1 Sensor 22 Low			
	Bit2: Input Module 1 Sensor 23 Open			
	Bit3: Input Module 1 Sensor 23 High			
	Bit4: Input Module 1 Sensor 23 Low			
	Bit5: Input Module 1 Sensor 24 Open			
	Bit6: Input Module 1 Sensor 24 High			
	Bit7: Input Module 1 Sensor 24 Low			
4	Bit0: Input Module 2 Comm. Failure	1	0	
	Bit1: Input Module 2 Exhaust Temp High			
	Bit2: Input Module 2 Sensor 15 Open			
	Bit3: Input Module 2 Sensor 15 High			
	Bit4: Input Module 2 Sensor 15 Low			
	Bit5: Input Module 2 Sensor 16 Open			
	Bit6: Input Module 2 Sensor 16 High			
	Bit7: Input Module 2 Sensor 16 Low			
5	Bit0: Input Module 2 Sensor 17 Open	1	0	
	Bit1: Input Module 2 Sensor 17 High			
	Bit2: Input Module 2 Sensor 17 Low			
	Bit3: Input Module 2 Sensor 18 Open			
	Bit4: Input Module 2 Sensor 18 High			
	Bit5: Input Module 2 Sensor 18 Low			
	Bit6: Input Module 2 Sensor 19 Open			
	Bit7: Input Module 2 Sensor 19 High			
6	Bit0: Input Module 2Sensor 19 Low	1	0	
	Bit1: Input Module 2 Sensor 20 Open			
	Bit2: Input Module 2 Sensor 20 High			
	Bit3: Input Module 2 Sensor 20 Low			
	Bit4: Input Module 2 Sensor 21 Open			
	Bit5: Input Module 2 Sensor 21 High			
	Bit6: Input Module 2 Sensor 21 Low			
	Bit7: Input Module 2 Sensor 22 Open			
7	Bit0: Input Module 2 Sensor 22 High	1	0	
	Bit1: Input Module 2 Sensor 22 Low			
	Bit2: Input Module 2 Sensor 23 Open			
	Bit3: Input Module 2 Sensor 23 High			
	Bit4: Input Module 2 Sensor 23 Low			
	Bit5: Input Module 2 Sensor 24 Open			
	Bit6: Input Module 2 Sensor 24 High			
	Bit7: Input Module 2 Sensor 24 Low			

(3) **formation_3:**【ID: 0x18031000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x03	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Input Port 1 Shutdown	1	0	
	Bit1: Input Port 2 Shutdown			
	Bit2: Input Port 3 Shutdown			
	Bit3: Input Port 4 Shutdown			
	Bit4: Input Port 5 Shutdown			
	Bit5: Input Port 6 Shutdown			
	Bit6: Input Port 7 Shutdown			
	Bit7: Input Port 8 Shutdown			
1	Bit0: Reserved	1	0	
	Bit1: Reserved			
	Bit2: Reserved			
	Bit3: Reserved			
	Bit4: PLC Function 1			
	Bit5: PLC Function 2			
	Bit6: PLC Function 3			
	Bit7: PLC Function 4			
2	Bit0: PLC Function 5	1	0	
	Bit1: PLC Function 6			
	Bit2: PLC Function 7			
	Bit3: PLC Function 8			
	Bit4: PLC Function 9			
	Bit5: PLC Function 10			
	Bit6: PLC Function 11			
	Bit7: PLC Function 12			
3	Bit0: PLC Function 13	1	0	
	Bit1: PLC Function 14			
	Bit2: PLC Function 15			
	Bit3: PLC Function 16			
	Bit4: PLC Function 17			
	Bit5: PLC Function 18			
	Bit6: PLC Function 19			
	Bit7: PLC Function 20			
4	Bit0: Reserved	1	0	
	Bit1: Reserved			

	Bit2: Expand Digital Input Comm. Failure			
	Bit3: Expand Digital Output Comm. Failure			
	Bit4: Expand Digital Input 1			
	Bit5: Expand Digital Input 2			
	Bit6: Expand Digital Input 3			
	Bit7: Expand Digital Input 4			
5	Bit0: Expand Digital Input 5	1	0	
	Bit1: Expand Digital Input 6			
	Bit2: Expand Digital Input 7			
	Bit3: Expand Digital Input 8			
	Bit4: Expand Digital Input 9			
	Bit5: Expand Digital Input 10			
	Bit6: Expand Digital Input 11			
	Bit7: Expand Digital Input 12			
6	Bit0: Expand Digital Input 13	1	0	
	Bit1: Expand Digital Input 14			
	Bit2: Expand Digital Input 15			
	Bit3: Expand Digital Input 16			
	Bit4: Input Module 1 Cylinder Temperature Difference Large			
	Bit5: Input Module 1 Cylinder Temp High			
	Bit6: Input Module 2 Cylinder Temperature Difference Large			
	Bit7: Input Module 2 Cylinder Temp High			
7	Bit0: Reserved	1	0	
	Bit1: Reserved			
	Bit2: Reserved			
	Bit3: Reserved			
	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Reserved			
	Bit7: Reserved			

(4) **formation_4:**【ID: 0x18041000+CAN_ID】

<table>
<tr><td colspan="7">Sender: Module</td><td colspan="7">Receiver: Monitoring Equipment</td><td colspan="8">Frame Format: Extended Data Frame</td><td colspan="7">Send Period: 800ms</td></tr>
<tr><td colspan="29">ID</td></tr>
<tr><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td colspan="5">CODE = 0x18</td><td colspan="8">FID = 0x04</td><td colspan="8">PS = 0x10</td><td colspan="8">SA = CAN ID （0x40/0x41/0x42/0x43）</td></tr>
<tr><td colspan="29">Length</td></tr>
<tr><td colspan="29">8</td></tr>
<tr><td colspan="29">Data</td></tr>
</table>

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Overcurrent Trip and Stop	1	0	

	Bit1: Maintenance Due Trip and Stop			
	Bit2: Reverse Power Trip and Stop			
	Bit3: Over Power Trip and Stop			
	Bit4: Input Port 1 Trip and Stop			
	Bit5: Input Port 2 Trip and Stop			
	Bit6: Input Port 3 Trip and Stop			
	Bit7: Input Port 4 Trip and Stop			
1	Bit0: Input Port 5 Trip and Stop	1	0	
	Bit1: Input Port 6 Trip and Stop			
	Bit2: Input Port 7 Trip and Stop			
	Bit3: Input Port 8 Trip and Stop			
	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Expand Digital Input Comm. Failure			
	Bit7: Expand Digital Output Comm. Failure			
2	Bit0: PLC Function 1	1	0	
	Bit1: PLC Function 2			
	Bit2: PLC Function 3			
	Bit3: PLC Function 4			
	Bit4: PLC Function 5			
	Bit5: PLC Function 6			
	Bit6: PLC Function 7			
	Bit7: PLC Function 8			
3	Bit0: PLC Function 9	1	0	
	Bit1: PLC Function 10			
	Bit2: PLC Function 11			
	Bit3: PLC Function 12			
	Bit4: PLC Function 13			
	Bit5: PLC Function 14			
	Bit6: PLC Function 15			
	Bit7: PLC Function 16			
4	Bit0: PLC Function 17	1	0	
	Bit1: PLC Function 18			
	Bit2: PLC Function 19			
	Bit3: PLC Function 20			
	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Expand Digital Input 1			
	Bit7: Expand Digital Input 2			
5	Bit0: Expand Digital Input 3	1	0	
	Bit1: Expand Digital Input 4			
	Bit2: Expand Digital Input 5			
	Bit3: Expand Digital Input 6			
	Bit4: Expand Digital Input 7			
	Bit5: Expand Digital Input 8			
	Bit6: Expand Digital Input 9			

	Bit7: Expand Digital Input 10			
6	Bit0: Expand Digital Input 11	1	0	
	Bit1: Expand Digital Input 12			
	Bit2: Expand Digital Input 13			
	Bit3: Expand Digital Input 14			
	Bit4: Expand Digital Input 15			
	Bit5: Expand Digital Input 16			
	Bit6: Mains Overfrequency Trip and Stop			
	Bit7: Mains Underfrequency Trip and Stop			
7	Bit0: Mains Overvoltage Trip and Stop	1	0	
	Bit1: Mains Undervoltage Trip and Stop			
	Bit2: Mains ROCOF Trip and Stop			
	Bit3: Mains Vector Shift Trip and Stop			
	Bit4: Sync Failure Trip and Stop			
	Bit5: Loss of Excitation Trip and Stop			
	Bit6: Earth Fault Trip and Sto[			
	Bit7: Current Unbalance Trip and Stop			

(5) **formation_5:**【ID: 0x18051000+CAN_ID】

Sender: Module				Receiver: Monitoring Equipment				Frame Format: Extended Data Frame				Send Period: 800ms			
ID															
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
12	11	10	9	8	7	6	5	4	3	2	1	0			
CODE = 0x18				FID = 0x05				PS = 0x10				SA = CAN ID（0x40/0x41/0x42/0x43）			
Length															
8															
Data															

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Overcurrent Trip	1	0	
	Bit1: Maintenance Due Trip			
	Bit2: Reverse Power Trip			
	Bit3: Over Power Trip			
	Bit4: Input Port 1 Trip			
	Bit5: Input Port 2 Trip			
	Bit6: Input Port 3 Trip			
	Bit7: Input Port 4 Trip			
1	Bit0: Input Port 5 Trip	1	0	
	Bit1: Input Port 6 Trip			
	Bit2: Input Port 7 Trip			
	Bit3: Input Port 8 Trip			
	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Expand Digital Input Comm. Failure			

	Bit7: Expand Digital Output Comm. Failure			
2	Bit0: PLC Function 1	1	0	
	Bit1: PLC Function 2			
	Bit2: PLC Function 3			
	Bit3: PLC Function 4			
	Bit4: PLC Function 5			
	Bit5: PLC Function 6			
	Bit6: PLC Function 7			
	Bit7: PLC Function 8			
3	Bit0: PLC Function 9	1	0	
	Bit1: PLC Function 10			
	Bit2: PLC Function 11			
	Bit3: PLC Function 12			
	Bit4: PLC Function 13			
	Bit5: PLC Function 14			
	Bit6: PLC Function 15			
	Bit7: PLC Function 16			
4	Bit0: PLC Function 17	1	0	
	Bit1: PLC Function 18			
	Bit2: PLC Function 19			
	Bit3: PLC Function 20			
	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Expand Digital Input 1			
	Bit7: Expand Digital Input 2			
5	Bit0: Expand Digital Input 3	1	0	
	Bit1: Expand Digital Input 4			
	Bit2: Expand Digital Input 5			
	Bit3: Expand Digital Input 6			
	Bit4: Expand Digital Input 7			
	Bit5: Expand Digital Input 8			
	Bit6: Expand Digital Input 9			
	Bit7: Expand Digital Input 10			
6	Bit0: Expand Digital Input 11	1	0	
	Bit1: Expand Digital Input 12			
	Bit2: Expand Digital Input 13			
	Bit3: Expand Digital Input 14			
	Bit4: Expand Digital Input 15			
	Bit5: Expand Digital Input 16			
	Bit6: Reserved			
	Bit7: Reserved			
7	Bit0: Gen Insufficient Capacity	1	0	
	Bit1: Mains Switch Failure			
	Bit2: Gen Switch Failure			
	Bit3: MSC Too Few Trip			

	Bit4: Loss of Excitation Fault Trip			
	Bit5: Earth Fault Trip			
	Bit6: Current Unbalance Trip			
	Bit7: Sync Failure Trip			

(6) **formation_6:**【ID: 0x18061000+CAN_ID】

Sender: Module								Receiver: Monitoring Equipment							Frame Format: Extended Data Frame								Send Period: 800ms							
ID																														
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
CODE = 0x18								FID = 0x06							PS = 0x10								SA = CAN ID（0x40/0x41/0x42/0x43）							
Length																														
8																														
Data																														

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Overspeed Warning	1	0	
	Bit1: Underspeed Warning			
	Bit2: Loss of Speed Signal Warning			
	Bit3: Gen Overfrequency Warning			
	Bit4: Gen Underfrequency Warning			
	Bit5: Gen Overvoltage Warning			
	Bit6: Gen Undervoltage Warning			
	Bit7: Gen Overcurrent Warning			
1	Bit0: Stop Failure Warning	1	0	
	Bit1: Charge Failure Warning			
	Bit2: Battery Overvoltage Warning			
	Bit3: Battery Undervoltage Warning			
	Bit4: Maintenance Due Warning			
	Bit5: Reverse Power Warning			
	Bit6: Over Power Warning			
	Bit7: ECU Warning			
2	Bit0: Gen Loss of Phase Warning	1	0	
	Bit1: Gen Reverse Phase Sequence Warning			
	Bit2: Sync Failure Warning			
	Bit3: Current Unbalance Warning			
	Bit4: Earth Fault Warning			
	Bit5: Loss of Excitation Fault Warning			
	Bit6: Mains Switch Failure Warning			
	Bit7: Gen Switch Failure Warning			
3	Bit0: Temperature Sensor Open	1	0	
	Bit1: High Temperature Warning			
	Bit2: Low Temperature Warning			
	Bit3: GOV Reaches Limit Value			

	Bit4: Oil Pressure Sensor Open			
	Bit5: Reserved			
	Bit6: Low Oil Pressure Warning			
	Bit7: AVR Reaches Limnit Value			
4	Bit0: Level Sensor Open	1	0	
	Bit1: Reserved			
	Bit2: Low Level Warning			
	Bit3: Gen Insufficient Capacity			
	Bit4: Aux. Sensor 1 Open			
	Bit5: Aux. Sensor 1 High			
	Bit6: Aux. Sensor 1 Low			
	Bit7: Reserved			
5	Bit0: Aux. Sensor 2 Open	1	0	
	Bit1: Aux. Sensor 2 High			
	Bit2: Aux. Sensor 2 Low			
	Bit3: Reserved			
	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Reserved			
	Bit7: Input Module 2 Cylinder Temp High			
6	Bit0: Input Module 1 Comm. Failure	1	0	
	Bit1: Input Module 1 Exhaust Temp High			
	Bit2: Input Module 1 Sensor 15 Open			
	Bit3: Input Module 1 Sensor 15 High			
	Bit4: Input Module 1 Sensor 15 Low			
	Bit5: Input Module 1 Sensor 16 Open			
	Bit6: Input Module 1 Sensor 16 High			
	Bit7: Input Module 1 Sensor 16 Low			
7	Bit0: Input Module 1 Sensor 17 Open	1	0	
	Bit1: Input Module 1 Sensor 17 High			
	Bit2: Input Module 1 Sensor 17 Low			
	Bit3: Input Module 1 Sensor 18 Open			
	Bit4: Input Module 1 Sensor 18 High			
	Bit5: Input Module 1 Sensor 18 Low			
	Bit6: Input Module 1 Sensor 19 Open			
	Bit7: Input Module 1 Sensor 19 High			

(7) **formation_7:**【ID: 0x18071000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CODE = 0x18					FID = 0x07								PS = 0x10						SA = CAN ID（0x40/0x41/0x42/0x43）									

Length
8

Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Input Module 1 Sensor 19 Low	1	0	
	Bit1: Input Module 1 Sensor 20 Open			
	Bit2: Input Module 1 Sensor 20 High			
	Bit3: Input Module 1 Sensor 20 Low			
	Bit4: Input Module 1 Sensor 21 Open			
	Bit5: Input Module 1 Sensor 21 High			
	Bit6: Input Module 1 Sensor 21 Low			
	Bit7: Input Module 1 Sensor 22 Open			
1	Bit0: Input Module 1 Sensor 22 High	1	0	
	Bit1: Input Module 1 Sensor 22 Low			
	Bit2: Input Module 1 Sensor 23 Open			
	Bit3: Input Module 1 Sensor 23 High			
	Bit4: Input Module 1 Sensor 23 Low			
	Bit5: Input Module 1 Sensor 24 Open			
	Bit6: Input Module 1 Sensor 24 High			
	Bit7: Input Module 1 Sensor 24 Low			
2	Bit0: Input Module 2 Comm. Failure	1	0	
	Bit1: Input Module 2 Exhaust Temp High			
	Bit2: Input Module 2 Sensor 15 Open			
	Bit3: Input Module 2 Sensor 15 High			
	Bit4: Input Module 2 Sensor 15 Low			
	Bit5: Input Module 2 Sensor 16 Open			
	Bit6: Input Module 2 Sensor 16 High			
	Bit7: Input Module 2 Sensor 16 Low			
3	Bit0: Input Module 2 Sensor 17 Open	1	0	
	Bit1: Input Module 2 Sensor 17 High			
	Bit2: Input Module 2 Sensor 17 Low			
	Bit3: Input Module 2 Sensor 18 Open			
	Bit4: Input Module 2 Sensor 18 High			
	Bit5: Input Module 2 Sensor 18 Low			
	Bit6: Input Module 2 Sensor 19 Open			
	Bit7: Input Module 2 Sensor 19 High			
4	Bit0: Input Module 2 Sensor 19 Low	1	0	
	Bit1: Input Module 2 Sensor 20 Open			
	Bit2: Input Module 2 Sensor 20 High			

	Bit3: Input Module 2 Sensor 20 Low			
	Bit4: Input Module 2 Sensor 21 Open			
	Bit5: Input Module 2 Sensor 21 High			
	Bit6: Input Module 2 Sensor 21 Low			
	Bit7: Input Module 2 Sensor 22 Open			
5	Bit0: Input Module 2 Sensor 22 High	1	0	
	Bit1: Input Module 2 Sensor 22 Low			
	Bit2: Input Module 2 Sensor 23 Open			
	Bit3: Input Module 2 Sensor 23 High			
	Bit4: Input Module 2 Sensor 23 Low			
	Bit5 Input Module 2 Sensor 24 Open			
	Bit6: Input Module 2 Sensor 24 High			
	Bit7: Input Module 2 Sensor 24 Low			
6	Bit0: Reserved	1	0	
	Bit1: Expand Digital Input Comm. Failure			
	Bit2: Expand Digital Output Comm. Failure			
	Bit3: Expand Digital Input 1			
	Bit4: Expand Digital Input 2			
	Bit5: Expand Digital Input 3			
	Bit6: Expand Digital Input 4			
	Bit7: Expand Digital Input 5			
7	Bit0: Expand Digital Input 6	1	0	
	Bit1: Expand Digital Input 7			
	Bit2: Expand Digital Input 8			
	Bit3: Expand Digital Input 9			
	Bit4: Expand Digital Input 10			
	Bit5: Expand Digital Input 11			
	Bit6: Expand Digital Input 12			
	Bit7: Expand Digital Input 13			

(8) **formation_8:**【ID: 0x18081000+CAN_ID】

Sender: Module								Receiver: Monitoring Equipment							Frame Format: Extended Data Frame								Send Period: 800ms							
ID																														
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
CODE = 0x18								FID = 0x08							PS = 0x10								SA = CAN ID（0x40/0x41/0x42/0x43）							
Length																														
8																														
Data																														

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Expand Digital Input 14	1	0	
	Bit1: Expand Digital Input 15			
	Bit2: Expand Digital Input 16			

	Bit3: Mains Overfrequency Warning			
	Bit4: Mains Underfrequency Warning			
	Bit5: Mains Overvoltage Warning			
	Bit6: Mains Undervoltage Warning			
	Bit7: Mains ROCOF Warning			
1	Bit0: Mains Vector Shift Warning	1	0	
	Bit1: Frequency Error Large Warning			
	Bit2: MSC Too Few Warning			
	Bit3: Input Module 1 Cylinder Temperature Difference Large			
	Bit4: Input Module 1 Cylinder Temp High			
	Bit5: Input Module 2 Cylinder Temperature Difference Large			
	Bit6: Input Module 2 Cylinder Temp High			
	Bit7: HMP300 Comm. Failure			
2	Bit0: Input Port 1 Warning	1	0	
	Bit1: Input Port 2 Warning			
	Bit2: Input Port 3 Warning			
	Bit3: Input Port 4 Warning			
	Bit4: Input Port 5 Warning			
	Bit5: Input Port 6 Warning			
	Bit6: Input Port 7 Warning			
	Bit7: Input Port 8 Warning			
3	Bit0: Reserved	1	0	
	Bit1: Reserved			
	Bit2: Reserved			
	Bit3: Reserved			
	Bit4: PLC Function 1			
	Bit5: PLC Function 2			
	Bit6: PLC Function 3			
	Bit7: PLC Function 4			
4	Bit0: PLC Function 5	1	0	
	Bit1: PLC Function 6			
	Bit2: PLC Function 7			
	Bit3: PLC Function 8			
	Bit4: PLC Function 9			
	Bit5: PLC Function 10			
	Bit6: PLC Function 11			
	Bit7: PLC Function 12			
5	Bit0: PLC Function 13	1	0	
	Bit1: PLC Function 14			
	Bit2: PLC Function 15			
	Bit3: PLC Function 16			
	Bit4: PLC Function 17			
	Bit5: PLC Function 18			
	Bit6: PLC Function 19			

	Bit7: PLC Function 20			
6	Bit0: Inhibit Alarm Shutdown Indication	1	0	
	Bit1: Maintenance Due Indication			
	Bit2: In Scheduled Not Run Indication			
	Bit3: Reserved			
	Bit4: PLC Function 1			
	Bit5: PLC Function 2			
	Bit6: PLC Function 3			
	Bit7: PLC Function 4			
7	Bit0: PLC Function 5	1	0	
	Bit1: PLC Function 6			
	Bit2: PLC Function 7			
	Bit3: PLC Function 8			
	Bit4: PLC Function 9			
	Bit5: PLC Function 10			
	Bit6: PLC Function 11			
	Bit7: PLC Function 12			

(9) **formation_9:**【ID: 0x18091000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x09	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: PLC Function 13	1	0	
	Bit1: PLC Function 14			
	Bit2: PLC Function 15			
	Bit3: PLC Function 16			
	Bit4: PLC Function 17			
	Bit5: PLC Function 18			
	Bit6: Auto Mode Input			
	Bit7: Auto Mode Invalid			
1	Bit0: Reserved	1	0	
	Bit1: Power Management Mode			
	Bit2: Selectable Configuration 1 Indication			
	Bit3: Selectable Configuration 2 Indication			
	Bit4: Selectable Configuration 3 Indication			
	Bit5: Overcurrent Indication			
	Bit6: Reverse Power Indication			

	Bit7: Over Power Indication			
2	Bit0: Input Port 1 Indication	1	0	
	Bit1: Input Port 2 Indication			
	Bit2: Input Port 3 Indication			
	Bit3: Input Port 4 Indication			
	Bit4: Input Port 5 Indication			
	Bit5: Input Port 6 Indication			
	Bit6: Input Port 7 Indication			
	Bit7: Input Port 8 Indication			
3	Bit0: Reserved	1	0	
	Bit1: Reserved			
	Bit2: Expand Digital Input Comm. Failure			
	Bit3: Expand Digital Output Comm. Failure			
	Bit4: Reserved			
	Bit5: Loss of Excitation Fault			
	Bit6: Earth Fault			
	Bit7: Current Unbalance			
4	Bit0: Expand Digital Input 1	1	0	
	Bit1: Expand Digital Input 2			
	Bit2: Expand Digital Input 3			
	Bit3: Expand Digital Input 4			
	Bit4: Expand Digital Input 5			
	Bit5: Expand Digital Input 6			
	Bit6: Expand Digital Input 7			
	Bit7: Expand Digital Input 8			
5	Bit0: Expand Digital Input 9	1	0	
	Bit1: Expand Digital Input 10			
	Bit2: Expand Digital Input 11			
	Bit3: Expand Digital Input 12			
	Bit4: Expand Digital Input 13			
	Bit5: Expand Digital Input 14			
	Bit6: Expand Digital Input 15			
	Bit7: Expand Digital Input 16			
6	Bit0: Emergency Input Port Status	1	0	
	Bit1: Input Port 1 Status			
	Bit2: Input Port 2 Status			
	Bit3: Input Port 3 Status			
	Bit4: Input Port 4 Status			
	Bit5: Input Port 5 Status			
	Bit6: Input Port 6 Status			
	Bit7: Input Port 7 Status			
7	Bit0: Input Port 8 Status	1	0	
	Bit1: Reserved			
	Bit2: Reserved			
	Bit3: Reserved			

	Bit4: Reserved			
	Bit5: Reserved			
	Bit6: Reserved			
	Bit7: Reserved			

(10) **formation_10:**【ID: 0x180A1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID

28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CODE = 0x18					FID = 0x0A								PS = 0x10								SA = CAN ID (0x40/0x41/0x42/0x43)							

Length: 8

Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Reserved	1	0	
1	Reserved	1	0	
2	Bit0: Fuel Relay Output Status	1	0	
	Bit1: Crank Relay Output Status			
	Bit2: Aux. Output Port 1 Status			
	Bit3: Aux. Output Port 2 Status			
	Bit4: Aux. Output Port 3 Status			
	Bit5: Aux. Output Port 4 Status			
	Bit6: Aux. Output Port 5 Status			
	Bit7: Aux. Output Port 6 Status			
3	Reserved	1	0	
4	Reserved	1	0	
5	Reserved	1	0	
6	Reserved	1	0	
7	Reserved	1	0	

(11) **formation_11:**【ID: 0x180B1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID

28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
(CODE = 0x18					FID = 0x0B								PS =0x10								SA = CAN ID (0x40/0x41/0x42/0x43)							

Length: 8

Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Reserved	1	0	
1	Reserved	1	0	
2	Reserved	1	0	
3	Reserved	1	0	
4	Reserved	1	0	
5	Reserved	1	0	
6	Bit0: Mains Normal	1	0	
	Bit1: Mains Close			
	Bit2: Gen Normal			
	Bit3: Gen Close			
	Bit4: Alarm Indicator Status			
	Bit5: Running Indicator Status			
	Bit6: Reserved			
	Bit7: Reserved			
7	Reserved	1	0	

(12) **formation_12:**【ID: 0x180C1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																											
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x0C	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）
Length			
8			
Data			

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Bit0: Mains Abnormal	1	0	
	Bit1: Mains Overvoltage			
	Bit2: Mains Undervoltage			
	Bit3: Mains Overfrequency			
	Bit4: Mains Underfrequency			
	Bit5: Mains Loss of Phase			
	Bit6: Mains Reverse Phase Sequence			
	Bit7: No Mains			
1	Reserved	1	0	
2	Bit0: Input Port 1 Active	1	0	
	Bit1: Input Port 2 Active			
	Bit2: Input Port 3 Active			
	Bit3: Input Port 4 Active			
	Bit4: Input Port 5 Active			
	Bit5: Input Port 6 Active			
	Bit6: Input Port 7 Active			
	Bit7: Input Port 8 Active			

3	Reserved	1	0	
4	Reserved	1	0	
5	Reserved	1	0	
6	Bit0: Mains Normal Bit1: Mains Close Bit2: Gen Normal Bit3: Gen Close Bit4: Alarm Indicator Status Bit5: Running Indicator Status Bit6: Reserved Bit7: Reserved	1	0	
7	Reserved	1	0	

(13) **formation_13:**【ID: 0x180D1000+CAN_ID】

Sender: Module				Receiver: Monitoring Equipment				Frame Format: Extended Data Frame				Send Period: 800ms			
ID															
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
12	11	10	9	8	7	6	5	4	3	2	1	0			
CODE = 0x18				FID = 0x0D								PS = 0x10			
12	11	10	9	8	7	6	5	4	3	2	1	0			
SA = CAN ID（0x40/0x41/0x42/0x43）															
Length															
8															
Data															

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(14) **formation_14:**【ID: 0x180E1000+CAN_ID】

Sender: Module				Receiver: Monitoring Equipment				Frame Format: Extended Data Frame				Send Period: 800ms			
ID															
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
12	11	10	9	8	7	6	5	4	3	2	1	0			
CODE = 0x18				FID = 0x0E								PS = 0x10			
12	11	10	9	8	7	6	5	4	3	2	1	0			
SA = CAN ID（0x40/0x41/0x42/0x43）															
Length															
8															
Data															

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~5	Reserved	1	0	
6	Mains UAB (Low 8-bit)	1	0	
7	Mains UAB (High 8-bit)	1	0	

(15) **formation_15:**【ID: 0x180F1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x0F	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Mains UBC (Low 8-bit)	1	0	
1	Mains UBC (High 8-bit)	1	0	
2	Mains UCA (Low 8-bit)	1	0	
3	Mains UCA (High 8-bit)			
4	Mains UA (Low 8-bit)			
5	Mains UA (High 8-bit)			
6	Mains UB (Low 8-bit)			
7	Mains UB (High 8-bit)			

(16) **formation_16:**【ID: 0x18101000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x10	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Mains UC (Low 8-bit)	1	0	
1	Mains UC (High 8-bit)	1	0	
2	Mains UA Phase (Low 8-bit)	1	0	
3	Mains UA Phase (High 8-bit)	1	0	
4	Mains UB Phase (Low 8-bit)	1	0	
5	Mains UB Phase (High 8-bit)	1	0	
6	Mains UC Phase (Low 8-bit)	1	0	
7	Mains UC Phase (High 8-bit)	1	0	

(17) **formation_17:**【ID: 0x18111000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x11	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Mains Frequency (Low 8-bit)	0.01	0	
1	Mains Frequency (High 8-bit)	0.01	0	
2~7	Reserved	1	0	

(18) **formation_18:**【ID: 0x18121000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x12	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(19) **formation_19:**【ID: 0x18131000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x13	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0~5	Reserved	1	0	
6	Gen UAB (Low 8-bit)	1	0	

7	Gen UAB (High 8-bit)	1	0	

(20) **formation_20:**【ID: 0x18141000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x14	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Gen UBC (Low 8-bit)	1	0	
1	Gen UBC (High 8-bit)	1	0	
2	Gen UCA (Low 8-bit)	1	0	
3	Gen UCA (High 8-bit)	1	0	
4	Gen UA (Low 8-bit)	1	0	
5	Gen UA (High 8-bit)	1	0	
6	Gen UB (Low 8-bit)	1	0	
7	Gen UB (High 8-bit)	1	0	

(21) **formation_21:**【0x18151000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x15	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Gen UC (Low 8-bit)	1	0	
1	Gen UC (High 8-bit)	1	0	
2	Gen UA Phase (Low 8-bit)	1	0	
3	Gen UA Phase (High 8-bit)	1	0	
4	Gen UB Phase (Low 8-bit)	1	0	
5	Gen UB Phase (High 8-bit)	1	0	
6	Gen UC Phase (Low 8-bit)	1	0	
7	Gen UC Phase (High 8-bit)	1	0	

(22) **formation_22:**【ID: 0x18161000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x16	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Gen Frequency (Low 8-bit)	0.01	0	
1	Gen Frequency (High 8-bit)	0.01	0	
2	Voltage Difference (Low 8-bit)	1	0	
3	Voltage Difference (High 8-bit)	1	0	
4	Frequency Difference (Low 8-bit)	0.01	0	
5	Frequency Difference (High 8-bit)	0.01	0	
6	Phase Difference (Low 8-bit)	0.1	0	
7	Phase Difference (High 8-bit)	0.1	0	

(23) **formation_23:**【ID: 0x18171000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x17	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Current Gen Active Percentage (Low 8-bit)	0.1	0	
1	Current Gen Active Percentage (High 8-bit)	0.1	0	
2	Target Gen Active Percentage (Low 8-bit)	0.1	0	
3	Target Gen Active Percentage (High 8-bit)	0.1	0	
4	Current Gen Reactive Percentage (Low 8-bit)	0.1	0	
5	Current Gen Reactive Percentage (High 8-bit)	0.1	0	
6	Target Gen Reactive Percentage (Low 8-bit)	0.1	0	
7	Target Gen Reactive Percentage (High 8-bit)	0.1	0	

(24) **formation_24:**【ID: 0x18181000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x18	PS =0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	GOV Output Percentage (Low 8-bit)	0.1	0	
1	GOV Output Percentage (High 8-bit)	0.1	0	
2	AVR Output Percentage (Low 8-bit)	0.1	0	
3	AVR Output Percentage (High 8-bit)	0.1	0	
4	Reserved	1	0	
5	Reserved	1	0	
6	A Phase Current (Low 8-bit)	0.1	0	
7	A Phase Current (High 8-bit)	0.1	0	

(25) **formation_25:**【ID: 0x18191000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x19	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	B Phase Current (Low 8-bit)	0.1	0	
1	B Phase Current (High 8-bit)	0.1	0	
2	C Phase Current (Low 8-bit)	0.1	0	
3	C Phase Current (High 8-bit)	0.1	0	
4	Earth Current (Low 8-bit)	0.1	0	
5	Earth Current (High 8-bit)	0.1	0	
6	Reserved	1	0	
7	Reserved	1	0	

(26) **formation_26:**【ID: 0x181A1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x1A	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(27) **formation_27:**【ID: 0x181B1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x1B	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	A Phase Active Power (Low 8-bit)	0.1	0	
1	A Phase Active Power (Sub-low 8-bit)	0.1	0	
2	A Phase Active Power (Sub-high 8-bit)	0.1	0	
3	A Phase Active Power (High 8-bit)	0.1	0	
4	B Phase Active Power (Low 8-bit)	0.1	0	
5	B Phase Active Power (Sub-low 8-bit)	0.1	0	
6	B Phase Active Power (Sub-high 8-bit)	0.1	0	
7	B Phase Active Power (High 8-bit)	0.1	0	

(28) **formation_28:**【ID: 0x181C1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x1C	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	C Phase Active Power (Low 8-bit)	0.1	0	
1	C Phase Active Power (Sub-low 8-bit)	0.1	0	
2	C Phase Active Power (Sub-high 8-bit)	0.1	0	
3	C Phase Active Power (High 8-bit)	0.1	0	
4	Total Active Power (Low 8-bit)	0.1	0	
5	Total Active Power (Sub-low 8-bit)	0.1	0	
6	Total Active Power (Sub-high 8-bit)	0.1	0	
7	Total Active Power (High 8-bit)	0.1	0	

(29) **formation_29:**【ID: 0x181D1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x1D	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	A Phase Reactive Power (Low 8-bit)	0.1	0	
1	A Phase Reactive Power (Sub-low 8-bit)	0.1	0	
2	A Phase Reactive Power (Sub-high 8-bit)	0.1	0	
3	A Phase Reactive Power (High 8-bit)	0.1	0	
4	B Phase Reactive Power (Low 8-bit)	0.1	0	
5	B Phase Reactive Power (Sub-low 8-bit)	0.1	0	
6	B Phase Reactive Power (Sub-high 8-bit)	0.1	0	
7	B Phase Reactive Power (High 8-bit)	0.1	0	

(30) **formation_30:**【ID: 0x181E1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x1E	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	C Phase Reactive Power (Low 8-bit)	0.1	0	
1	C Phase Reactive Power (Sub-low 8-bit)	0.1	0	
2	C Phase Reactive Power (Sub-high 8-bit)	0.1	0	
3	C Phase Reactive Power (High 8-bit)	0.1	0	
4	Total Reactive Power (Low 8-bit)	0.1	0	
5	Total Reactive Power (Sub-low 8-bit)	0.1	0	
6	Total Reactive Power (Sub-high 8-bit)	0.1	0	
7	Total Reactive Power (High 8-bit)	0.1	0	

(31) **formation_31:**【ID: 0x181F1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x1F	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	A Phase Apparent Power (Low 8-bit)	0.1	0	
1	A Phase Apparent Power (Sub-low 8-bit)	0.1	0	
2	A Phase Apparent Power (Sub-high 8-bit)	0.1	0	
3	A Phase Apparent Power (High 8-bit)	0.1	0	
4	B Phase Apparent Power (Low 8-bit)	0.1	0	
5	B Phase Apparent Power (Sub-low 8-bit)	0.1	0	
6	B Phase Apparent Power (Sub-high 8-bit)	0.1	0	
7	B Phase Apparent Power (High 8-bit)	0.1	0	

(32) **formation_32：**【ID: 0x18201000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x20	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	C Phase Apparent Power (Low 8-bit)	0.1	0	
1	C Phase Apparent Power (Sub-low 8-bit)	0.1	0	
2	C Phase Apparent Power (Sub-high 8-bit)	0.1	0	
3	C Phase Apparent Power (High 8-bit)	0.1	0	
4	Total Apparent Power (Low 8-bit)	0.1	0	
5	Total Apparent Power (Sub-low 8-bit)	0.1	0	
6	Total Apparent Power (Sub-high 8-bit)	0.1	0	
7	Total Apparent Power (High 8-bit)	0.1	0	

(33) **formation_33:**【ID: 0x18211000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x21	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	A Phase Power Factor (Low 8-bit)	0.01	0	
1	A Phase Power Factor (High 8-bit)	0.01	0	
2	B Phase Power Factor (Low 8-bit)	0.01	0	
3	B Phase Power Factor (High 8-bit)	0.01	0	
4	C Phase Power Factor (Low 8-bit)	0.01	0	
5	C Phase Power Factor (High 8-bit)	0.01	0	
6	Average Power Factor (Low 8-bit)	0.01	0	
7	Average Power Factor (High 8-bit)	0.01	0	

(34) **formation_34:**【ID: 0x18221000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x22	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Reserved	0.01	0	
1	Reserved	0.01	0	
2	Reserved	0.01	0	
3	Reserved	0.01	0	
4	Unbalanced Current (Low 8-bit)	0.01	0	
5	Unbalanced Current (High 8-bit)	0.01	0	
6	Mains A Phase Current (Low 8-bit)	0.01	0	
7	Mains A Phase Current (High 8-bit)	0.01	0	

(35) **formation_35:**【ID: 0x18231000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x23	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(36) **formation_36:**【ID: 0x18241000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x24	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~3	Reserved	1	0	
4	Engine Speed (Low 8-bit)	1		
5	Engine Speed (High 8-bit)	1		
6	Battery Voltage (Low 8-bit)	0.1		
7	Battery Voltage (High 8-bit)	0.1		

(37) **formation_37:**【ID: ID: 0x18251000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x25	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Charger Voltage (Low 8-bit)	0.1	0	
1	Charger Voltage (High 8-bit)	0.1		
2	GSM Signal Strength (Low 8-bit)	1		
3	GSM Signal Strength (High 8-bit)	1		
4~7	Reserved	1		

(38) **formation_38:**【ID: 0x18261000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x26	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~1	Reserved	1	0	
2	Temp Sensor Resistance Value (Low 8-bit)	0.1		
3	Temp Sensor Resistance Value (High 8-bit)	0.1		
4	Temp Sensor Value (Low 8-bit)	1		
5	Temp Sensor Value (High 8 位)	1		
6	Pressure Sensor Resistance Value (Low 8-bit)	0.1		
7	Pressure Sensor Resistance Value (High 8-bit)	0.1		

(39) **formation_39:**【ID: 0x18271000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x27	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Pressure Sensor Value (Low 8-bit)	1	0	
1	Pressure Sensor Value (High 8-bit)	1	0	
2	Level Sensor Resistance Value (Low 8-bit)	0.1	0	
3	Level Sensor Resistance Value (High 8-bit)	0.1	0	
4	Level Sensor Value (Low 8-bit)	1	0	
5	Level Sensor Value (High 8-bit)	1	0	
6	Aux. Sensor 1 Resistance Value (Low 8-bit)	0.1	0	
7	Aux. Sensor 1 Resistance Value (High 8-bit)	0.1	0	

(40) **formation_40:**【ID: 0x18281000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x28	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Aux. Sensor 1 Value (Low 8-bit)	1	0	
1	Aux. Sensor 1 Value (High 8-bit)	1	0	
2	Aux. Sensor 2 Resistance Value (Low 8-bit)	0.1	0	
3	Aux. Sensor 2 Resistance Value (High 8-bit)	0.1	0	
4	Aux. Sensor 2 Value (Low 8-bit)	1	0	
5	Aux. Sensor 2 Value (High 8-bit)	1	0	
6~7	Reserved	1	0	

(41) **formation_41:**【ID: 0x18291000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x29	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~5	Reserved	1	0	
6	Coolant Level (Low 8-bit)	1	0	It is reserved when engine is not ECU.
7	Coolant Level (High 8-bit)	1	0	It is reserved when engine is not ECU.

(42) **formation_42:**【ID: 0x182A1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x2A	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Oil Temperature (Low 8-bit)	1	0	
1	Oil Temperature (High 8-bit)	1	0	It is reserved when engine is not ECU.
2	Coolant Pressure (Low 8-bit)	1	0	It is reserved when engine is not ECU.
3	Coolant Pressure (High 8-bit)	1	0	It is reserved when engine is not ECU.
4	Fuel Pressure (Low 8-bit)	1	0	It is reserved when engine is not ECU.
5	Fuel Pressure (High 8-bit)	1	0	It is reserved when engine is not ECU.
6	Fuel Temperature (Low 8-bit)	1	0	It is reserved when engine is not ECU.
7	Fuel Temperature (High 8-bit)	1	0	It is reserved when engine is not ECU.

(43) **formation_43:**【ID: 0x182B1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x2B	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Inlet Temperature (Low 8-bit)	1	0	
1	Inlet Temperature (High 8-bit)	1	0	It is reserved when engine is not ECU.

2	Exhaust Temperature (Low 8-bit)	1	0	It is reserved when engine is not ECU.
3	Exhaust Temperature (High 8-bit)	1	0	It is reserved when engine is not ECU.
4	Turbo Pressure (Low 8-bit)	1	0	It is reserved when engine is not ECU.
5	Turbo Pressure (High 8-bit)	1	0	It is reserved when engine is not ECU.
6	Fuel Consumption (Low 8-bit)	1	0	It is reserved when engine is not ECU.
7	Fuel Consumption (High 8-bit)	1	0	It is reserved when engine is not ECU.

(44) **formation_44:**【ID: 0x182C1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x2C	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Accumulated Fuel Consumption (Low 8-bit)	1	0	
1	Accumulated Fuel Consumption (Sub-low 8-bit)	1	0	It is reserved when engine is not ECU.
2	Accumulated Fuel Consumption (Sub-high 8-bit)	1	0	It is reserved when engine is not ECU.
3	Accumulated Fuel Consumption (High 8-bit)	1	0	It is reserved when engine is not ECU.
4~7	Reserved	1	0	

(45) **formation_45:**【ID: 0x182D1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x2D	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~5	Reserved	1	0	
6	Mains B Phase Current (Low 8-bit)	0.1	0	It is active when HGM8152 & HMP300 are enabled.
7	Mains B Phase Current (High 8-bit)	0.1	0	It is active when HGM8152 & HMP300 are enabled.

(46) **formation_46:**【ID: 0x182E1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x2E	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Mains C Phase Current (Low 8-bit)	0.1	0	It is active when HGM8152 & HMP300 are enabled.
1	Mains C Phase Current (High 8-bit)	0.1	0	It is active when HGM8152 & HMP300 are enabled.。
2	Current Mains Active Percentage (Low 8-bit)	0.1	0	
3	Current Mains Active Percentage (High 8-bit)	0.1	0	
4	Current Mains Reactive Percentage (Low 8-bit)	0.1	0	
5	Current Mains Reactive Percentage (High 8-bit)	0.1	0	
6~7	Reserved			

(47) **formation_47:**【ID: 0x182F1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x2F	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Mains Active Power (Low 8-bit)	0.1	0	
1	Mains Active Power (Sub-low 8-bit)	0.1	0	
2	Mains Active Power (Sub-high 8-bit)	0.1	0	
3	Mains Active Power (High 8-bit)	0.1	0	
4	Mains Reactive Power (Low 8-bit)	0.1	0	
5	Mains Reactive Power (Sub-low 8-bit)	0.1	0	
6	Mains Reactive Power (Sub-high 8-bit)	0.1		
7	Mains Reactive Power (High 8-bit)	0.1		

(48) **formation_48:**【ID: 0x18301000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x30	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Mains Apparent Power (Low 8-bit)	0.1	0	
1	Mains Apparent Power (Sub-low 8-bit)	0.1	0	
2	Mains Apparent Power (Sub-high 8-bit)	0.1	0	
3	Mains Apparent Power (High 8-bit)	0.1	0	
4	Mains Power Factor (Low 8-bit)	0.01	0	
5	Mains Power Factor (High 8-bit)	0.01	0	
6	Generator Status (High 8-bit)	1	0	
7	Generator Status (High 8-bit)	1	0	

(49) **formation_49:**【ID: 0x18311000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x31	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Gen Delay Value (Low 8-bit)	1	0	
1	Gen Delay Value (High 8-bit)	1	0	
2	Remote Start Status (Low 8-bit)	1	0	
3	Remote Start Status (High 8-bit)	1	0	
4	Remote Start Delay Value (Low 8-bit)	1	0	
5	Remote Start Delay Value (High 8-bit)	1	0	
6	Gen Switch Status (Low 8-bit)	1	0	
7	Gen Switch Status (High 8-bit)	1	0	

(50) **formation_50:**【ID: 0x18321000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x32	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Gen Switch Transfer Delay Value (Low 8-bit)	1	0	
1	Gen Switch Transfer Delay Value (High 8-bit)	1	0	
2	Mains Status (Low 8-bit)	1	0	
3	Mains Status (High 8-bit)	1	0	
4	Mains Delay Value (Low 8-bit)	1	0	
5	Mains Delay Value (High 8-bit)	1	0	
6	Mains Switch Status (Low 8-bit)	1	0	
7	Mains Switch Status (High 8-bit)	1	0	

(51) **formation_51:**【ID: 0x18331000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Periods: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x33	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Mains Switch Transfer Delay Value (Low 8-bit)	1	0	
1	Mains Switch Transfer Delay Value (High 8-bit)	1	0	
2	Accumulated Running Hour (Low 8-bit)	1	0	
3	Accumulated Running Hour (High 8-bit)	1	0	
4	Accumulated Running Minute (Low 8-bit)	1	0	
5	Accumulated Running Minute (High 8-bit)	1	0	
6	Accumulated Running Second (Low 8-bit)	1	0	
7	Accumulated Running Second (High 8-bit)	1	0	

(52) **formation_52:**【ID: 0x18341000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x34	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Accumulated Start Times (Low 8-bit)	1	0	
1	Accumulated Start Times (High 8-bit)	1	0	
2	Accumulated Energy kWh (Low 8-bit)	1	0	
3	Accumulated Energy kWh (Sub-low 8-bit)	1	0	
4	Accumulated Energy kWh (Sub-high 8-bit)	1	0	
5	Accumulated Energy kWh (High 8-bit)	1	0	
6~7	Reserved	1	0	

(53) **formation_53:**【ID: 0x18351000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x35	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Accumulated Energy kvarh (Low 8-bit)	1	0	
1	Accumulated Energy kvarh (Sub-low 8-bit)	1	0	
2	Accumulated Energy kvarh (Sub-high 8-bit)	1	0	
3	Accumulated Energy kvarh (High 8-bit)	1	0	
4	Accumulated Energy kVAh (Low 8-bit)	1	0	
5	Accumulated Energy kVAh (Sub-low 8-bit)	1	0	
6	Accumulated Energy kVAh (Sub-high 8-bit)	1	0	
7	Accumulated Energy kVAh (High 8-bit)	1	0	

(54) **formation_54:**【ID: 0x18361000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x36	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~3	Reserved	1	0	
4	Maintenance Left Time (h) (Low 8-bit)	1	0	
5	Maintenance Left Time (h) (High 8-bit)	1	0	
6	Maintenance Left Time (min) (Low 8-bit)	1	0	
7	Maintenance Left Time (min) (High 8-bit)	1	0	

(55) **formation_55:**【ID: ID: 0x18371000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x37	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Maintenance Left Time (s) (Low 8-bit)	1	0	
1	Maintenance Left Time (s) (High 8-bit)	1	0	
2	Multi-unit Total Reactive Power (Low 8-bit)	0.1	0	
3	Multi-unit Total Reactive Power (Sub-low 8-bit)	0.1	0	
4	Multi-unit Total Reactive Power (Sub-high 8-bit)	0.1	0	
5	Multi-unit Total Reactive Power (High 8-bit)	0.1	0	
6~7	Reserved	1	0	

(56) **formation_56:**【ID: 0x18381000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x38	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Controller Model (Low 8-bit)	1	0	
1	Controller Model (High 8-bit)	1	0	
2	Controller Software Version (Low 8-bit)	0.1	0	
3	Controller Software Version (High 8-bit)	0.1	0	
4	Controller Hardware Version (Low 8-bit)	0.1	0	
5	Controller Hardware Version (High 8-bit)	0.1	0	
6	Controller Issue Year (Low 8-bit)	1	0	Only save last two digits of year.
7	Controller Issue Year (High 8-bit)	1	0	Only save last two digits of year.

(57) **formation_57:**【ID: 0x18391000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x39	PS =0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Controller Issue Month (Low 8-bit)	1	0	
1	Controller Issue Month (High 8-bit)	1	0	
2	Controller Issue Day (Low 8-bit)	1	0	
3	Controller Issue Day (High 8-bit)	1	0	
4~7	Reserved	1	0	

(58) **formation_58:**【ID: 0x183A1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x3A	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Controller Time: Year (Low 8-bit)	1	0	Only save last two digits of year.
1	Controller Time: Year (High 8-bit)	1	0	Only save last two digits of year.
2	Controller Time: Month (Low 8-bit)	1	0	
3	Controller Time: Month (High 8-bit)	1	0	
4	Controller Time: Day (Low 8-bit)	1	0	
5	Controller Time: Day (High 8-bit)	1	0	
6	Controller Time: Week (Low 8-bit)	1	0	
7	Controller Time: Week (High 8-bit)	1	0	

(59) **formation_59:**【ID: 0x183B1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x3B	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Controller Time: Hour (Low 8-bit)	1	0	
1	Controller Time: Hour (High 8-bit)	1	0	
2	Controller Time: Minute (Low 8-bit)	1	0	
3	Controller Time: Minute (High 8-bit)	1	0	
4	Controller Time: Second (Low 8-bit)	1	0	
5	Controller Time: Second (High 8-bit)	1	0	
6	Module MSC ID (Low 8-bit)	1	0	
7	Module MSC ID (High 8-bit)	1	0	

(60) **formation_60:**【ID: 0x183C1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x3C	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Module Priority (Low 8-bit)	1	0	
1	Module Priority (High 8-bit)	1	0	
2	Module Totals (Low 8-bit)	1	0	
3	Module Totals (High 8-bit)	1	0	
4	Multi-unit Total Active Power (Low 8-bit)	0.1	0	
5	Multi-unit Total Active Power (Sub-low 8-bit)	0.1	0	
6	Multi-unit Total Active Power (Sub-high 8-bit)	0.1	0	
7	Multi-unit Total Active Power (High 8-bit)	0.1	0	

(61) **formation_61:**【ID: 0x183D1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x3D	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~1	Reserved	1	0	
2	Expand AIN24-1, Sensor 15 (Low 8-bit)	1	0	
3	Expand AIN24-1, Sensor 15 (High 8-bit)	1	0	
4	Expand AIN24-1, Sensor 16 (Low 8-bit)	1	0	
5	Expand AIN24-1, Sensor 16 (High 8-bit)	1	0	
6	Expand AIN24-1, Sensor 17 (Low 8-bit)	1	0	
7	Expand AIN24-1, Sensor 17 (High 8-bit)	1	0	

(62) **formation_62:**【ID: 0x183E1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x3E	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-1, Sensor 18 (Low 8-bit)	1	0	
1	Expand AIN24-1, Sensor 18 (High 8-bit)	1	0	
2	Expand AIN24-1, Sensor 19 (Low 8-bit)	1	0	
3	Expand AIN24-1, Sensor 19 (High 8-bit)	1	0	
4	Expand AIN24-1, Sensor 20 (Low 8-bit)	1	0	
5	Expand AIN24-1, Sensor 20 (High 8-bit)	1	0	
6	Expand AIN24-1, Sensor 21 (Low 8-bit)	1	0	
7	Expand AIN24-1, Sensor 21 (High 8-bit)	1	0	

(63) **formation_63:**【ID: 0x183F1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Oeriod: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x3F	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-1, Sensor 22 (Low 8-bit)	1	0	
1	Expand AIN24-1, Sensor 22 (High 8-bit)	1	0	
2	Expand AIN24-1, Sensor 23 (Low 8-bit)	1	0	
3	Expand AIN24-1, Sensor 23 (High 8-bit)	1	0	
4	Expand AIN24-1, Sensor 24 (Low 8-bit)	1	0	
5	Expand AIN24-1, Sensor 24 (High 8-bit)	1	0	
6	Expand AIN24-2, Sensor 15 (Low 8-bit)	1	0	
7	Expand AIN24-2, Sensor 15 (High 8-bit)	1	0	

(64) **formation_64:**【ID: 0x18401000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x40	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-2, Sensor 16 (Low 8-bit)	1	0	
1	Expand AIN24-2, Sensor 16 (High 8-bit)	1	0	
2	Expand AIN24-2, Sensor 17 (Low 8-bit)	1	0	
3	Expand AIN24-2, Sensor 17 (High 8-bit)	1	0	
4	Expand AIN24-2, Sensor 18 (Low 8-bit)	1	0	
5	Expand AIN24-2, Sensor 18 (High 8-bit)	1	0	
6	Expand AIN24-2, Sensor 19 (Low 8-bit)	1	0	
7	Expand AIN24-2, Sensor 19 (High 8-bit)	1	0	

(65) **formation_65:**【ID: 0x18411000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x41	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-2, Sensor 20 (Low 8-bit)	1	0	
1	Expand AIN24-2, Sensor 20 (High 8-bit)	1	0	
2	Expand AIN24-2, Sensor 21 (Low 8-bit)	1	0	
3	Expand AIN24-2, Sensor 21 (High 8-bit)	1	0	
4	Expand AIN24-2, Sensor 22 (Low 8-bit)	1	0	
5	Expand AIN24-2, Sensor 22 (High 8-bit)	1	0	
6	Expand AIN24-2, Sensor 23 (Low 8-bit)	1	0	
7	Expand AIN24-2, Sensor 23 (High 8-bit)	1	0	

(66) **formation_66:**【ID: 0x18421000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x42	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8

Data				
BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-2, Sensor 24 (Low 8-bit)	1	0	
1	Expand AIN24-2, Sensor 24 (High 8-bit)	1	0	
2~7	Reserved	1	0	

(67) **formation_67:**【ID: 0x18431000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x43	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(68) **formation_68:**【ID: 0x18441000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x44	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(69) **formation_69:**【ID: 0x18451000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x45	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(70) **formation_70:**【ID: 0x18461000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x46	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(71) **formation_71:**【ID: 0x18471000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x47	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(72) **formation_72:**【ID: 0x18481000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x48	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~7	Reserved	1	0	

(73) **formation_73:**【ID: 0x18491000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x49	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0~1	Reserved	1	0	
2	Expand AIN24-1, Sensor 1 (Low 8-bit)	1	0	
3	Expand AIN24-1, Sensor 1 (High 8-bit)	1	0	
4	Expand AIN24-1, Sensor 2 (Low 8-bit)	1	0	
5	Expand AIN24-1, Sensor 2 (High 8-bit)	1	0	
6	Expand AIN24-1, Sensor 3 (Low 8-bit)	1	0	
7	Expand AIN24-1, Sensor 3 (High 8-bit)	1	0	

(74) **formation_74:**【ID: 0x184A1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x4A	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-1, Sensor 4 (Low 8-bit)	1	0	
1	Expand AIN24-1, Sensor 4 (High 8-bit)	1	0	
2	Expand AIN24-1, Sensor 5 (Low 8-bit)	1	0	
3	Expand AIN24-1, Sensor 5 (High 8-bit)	1	0	
4	Expand AIN24-1, Sensor 6 (Low 8-bit)	1	0	
5	Expand AIN24-1, Sensor 6 (High 8-bit)	1	0	
6	Expand AIN24-1, Sensor 7 (Low 8-bit)	1	0	
7	Expand AIN24-1, Sensor 7 (High 8-bit)	1	0	

(75) **formation_75:**【ID: 0x184B1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x4B	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-1, Sensor 8 (Low 8-bit)	1	0	
1	Expand AIN24-1, Sensor 8 (High 8-bit)	1	0	
2	Expand AIN24-1, Sensor 9 (Low 8-bit)	1	0	
3	Expand AIN24-1, Sensor 9 (High 8-bit)	1	0	
4	Expand AIN24-1, Sensor 10 (Low 8-bit)	1	0	
5	Expand AIN24-1, Sensor 10 (High 8-bit)	1	0	
6	Expand AIN24-1, Sensor 11 (Low 8-bit)	1	0	
7	Expand AIN24-1, Sensor 11 (High 8-bit)	1	0	

(76) **formation_76:**【ID: 0x184C1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x4C	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-1, Sensor 12 (Low 8-bit)	1	0	
1	Expand AIN24-1, Sensor 12 (High 8-bit)	1	0	
2	Expand AIN24-1, Sensor 13 (Low 8-bit)	1	0	
3	Expand AIN24-1, Sensor 13 (High 8-bit)	1	0	
4	Expand AIN24-1, Sensor 14 (Low 8-bit)	1	0	
5	Expand AIN24-1, Sensor 14 (High 8-bit)	1	0	
6	Expand AIN24-2, Sensor 1 (Low 8-bit)	1	0	
7	Expand AIN24-2, Sensor 1 (High 8-bit)	1	0	

(77) **formation_77:**【ID: 0x184D1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x4D	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-2, Sensor 2 (Low 8-bit)	1	0	
1	Expand AIN24-2, Sensor 2 (High 8-bit)	1	0	
2	Expand AIN24-2, Sensor 3 (Low 8-bit)	1	0	
3	Expand AIN24-2, Sensor 3 (High 8-bit)	1	0	
4	Expand AIN24-2, Sensor 4 (Low 8-bit)	1	0	
5	Expand AIN24-2, Sensor 4 (High 8-bit)	1	0	
6	Expand AIN24-2, Sensor 5 (Low 8-bit)	1	0	
7	Expand AIN24-2, Sensor 5 (High 8 位)	1	0	

(78) **formation_78:**【ID: 0x184E1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x4E	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-2, Sensor 6 (Low 8-bit)	1	0	
1	Expand AIN24-2, Sensor 6 (High 8-bit)	1	0	
2	Expand AIN24-2, Sensor 7 (Low 8-bit)	1	0	
3	Expand AIN24-2, Sensor 7 (High 8-bit)	1	0	
4	Expand AIN24-2, Sensor 8 (Low 8-bit)	1	0	
5	Expand AIN24-2, Sensor 8 (High 8-bit)	1	0	
6	Expand AIN24-2, Sensor 9 (Low 8-bit)	1	0	
7	Expand AIN24-2, Sensor 9 (High 8-bit)	1	0	

(79) **formation_79:**【ID: 0x184F1000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x4F	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-2, Sensor 10 (Low 8-bit)	1	0	
1	Expand AIN24-2, Sensor 10 (High 8-bit)	1	0	
2	Expand AIN24-2, Sensor 11 (Low 8-bit)	1	0	
3	Expand AIN24-2, Sensor 11 (High 8-bit)	1	0	
4	Expand AIN24-2, Sensor 12 (Low 8-bit)	1	0	
5	Expand AIN24-2, Sensor 12 (High 8-bit)	1	0	
6	Expand AIN24-2, Sensor 13 (Low 8-bit)	1	0	
7	Expand AIN24-2, Sensor 13 (High 8-bit)	1	0	

(80) **formation_80:**【ID: 0x18501000+CAN_ID】

Sender: Module	Receiver: Monitoring Equipment	Frame Format: Extended Data Frame	Send Period: 800ms

ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

CODE = 0x18	FID = 0x50	PS = 0x10	SA = CAN ID（0x40/0x41/0x42/0x43）

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark
0	Expand AIN24-2, Sensor 14 (Low 8-bit)	1	0	
1	Expand AIN24-2, Sensor 14 (High 8-bit)	1	0	
2~7	Reserved	1	0	

Monitoring equipment sends command to the module【ID: 0x18510010+(CAN_ID<<8)】

Sender: Monitoring Equipment	Receiver: Module	Frame Format: Extended Data Frame	Send Period: None

ID																												
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

CODE = 0x18	FID = 0x01	PS = 0x40	SA = 0x10

Length
8
Data

BYTE	Data Name	Resolution	Offset	RMS/Remark	
0	Control Command	1	0	0X00: Remote Start	
				0X01: Remote Stop	
				0X03: Remote Auto	
				0X04: Remote Manual	
				0X05: Remote Gen. Open	HGM8110 controller
				0X06: Remote Gen. Close	
				0X05: Remote Mains C/O	HGM8120 controller
				0X06: Remote Gen. C/O	
				0X07: Remote Up	
				0X08: Remote Down	
				0X09: Reserved	
				0X0A: Reserved	
				0X0B: Remote Confirm	
				0X0C: Remote Mute	
				0X0F: Remote Oil Engine Fast Stop	
				0X14：Remote Output 1	
				0X15：Remote Output 2	
				0X16：Remote Output 3	
				0X17：Remote Output 4	
				0X18：Remote Output 5	
				0X19：Remote Output 6	
				HGM8120 Controller: 05 Remote Mains C/O: when the control command is sending, if the mains is opened, it will control the mains to close; if the mains is closed, it will control the mains to open. 06 Remote Gen. C/O: when the control command is sending, if the genset is opened, it will control the genset to close; if the genset is closed, it will control the mains to open.	
1	Control Command Data	1	0	It is valid only with the remote outputs. 0 means it is inactive; 1 means it is active.	
2	Standby	1	0		
3	Standby	1	0		
4	Standby	1	0		
5	Standby	1	0		

6	Standby	1	0	
7	Standby	1	0	

Module responses to the monitoring module the command 【ID: 0x18511000+CAN_ID】

Sender: Monitoring Equipment																													
Receiver: Module																													
Frame Format: Extended Data Frame																													
Send Period: None																													
ID																													
28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
CODE = 0x18					FID = 0x51								PS=0x10						SA =CAN ID （0x40/0x41/0x42/0x43）										
Length																													
8																													
Data																													

BYTE	Data Name	Resolution	Offset	RMS/Remark	
0	Control Command	1	0	0X00: Remote Start	
				0X01: Remote Stop	
				0X03: Remote Auto	
				0X04: Remote Manual	
				0X05: Remote Gen. Open	HGM8110 controller
				0X06: Remote Gen. Close	
				0X05: Remote Mains C/O	HGM8120 controller
				0X06: Remote Gen. C/O	
				0X07: Remote Up	
				0X08: Remote Down	
				0X09: Reserved	
				0X0A: Reserved	
				0X0B: Remote Confirm	
				0X0C: Remote Mute	
				0X0F: Remote Oil Engine Fast Stop	
				0X14：Remote Output 1	
				0X15：Remote Output 2	
				0X16：Remote Output 3	
				0X17：Remote Output 4	
				0X18：Remote Output 5	
				0X19：Remote Output 6	
				HGM8120 Controller: 05 Remote Mains C/O: when the control command is sending, if the mains is opened, it will control the mains to close; if the mains is closed, it will control the mains to open. 06 Remote Gen. C/O: when the control command is sending, if the genset is opened, it will control the genset to close; if the genset is closed, it will control the mains to open.	
1	Control	1	0	It is valid only with the remote outputs.	

	Command Data			0 means it is inactive; 1 means it is active.
2	Standby	1	0	
3	Standby	1	0	
4	Standby	1	0	
5	Standby	1	0	
6	Standby	1	0	
7	Standby	1	0	

5. FAQ

Common solutions of communication failure:

1) Check whether the module connection is correct;
2) Check whether CAN communication baud rate is 250kbps;
3) It is recommended to download third-party communication software like CANTest to check whether communication is normal.