Reset procedure for module versions with 12 bytes of output data

Resetting energy counters for all 3 phases 重置三相的计数器

1. Select the categories of energy counter that you want to reset in byte 2:
   - Set bit 5 for active energy counters.
   - Set bit 6 for reactive energy counters.
   - Set bit 7 for apparent energy counters.

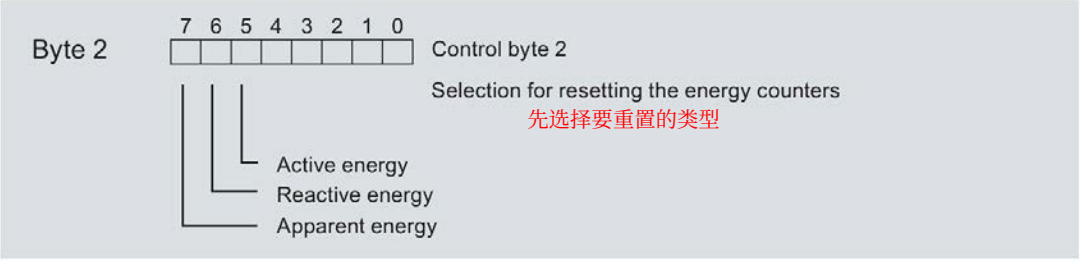

Figure 7-3 Selection of energy counters

2. Set the reset bit (bit 7) in byte 1. 再启动复位开关

   If there is an edge change of the reset bit for energy counters from 0 to 1, the module resets all energy counters that you previously selected in byte 2.

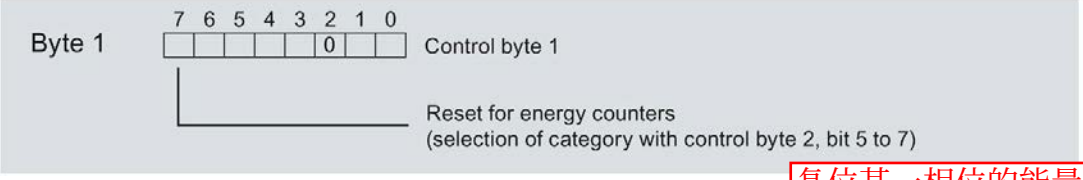

Figure 7-4 Reset bit for energy counters 能量计数器复位位

复位某一相位的能量计数器

Resetting energy counters for phase-specific measurement 重置特定相位测量的能量计数器

You can also reset the energy counters on a phase-specific basis using the output data.

Follow the procedure for "Resetting energy counters for all 3 phases" as applicable.

1. Select the categories of energy counter that you want to reset on a phase-specific basis.
   - Set the bits for the phase 1 energy counters in byte 7.
   - Set the bits for the phase 2 energy counters in byte 9.
   - Set the bits for the phase 3 energy counters in byte 11.
2. Set the reset bit (bit 7)
   - in byte 6 for phase 1
   - in byte 8 for phase 2
   - in byte 10 for phase 3

If there is an edge change of the phase-specific reset bit for energy counters from 0 to 1, the module resets the energy counters for the given phase:

Reset procedure for module version with 2 bytes of output data

Set the reset bit (Bit 7) in Control byte 1 from 0 to 1 through a positive edge change.

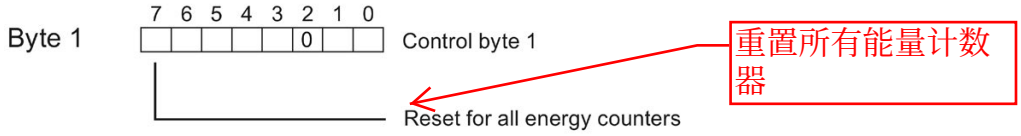

Figure 7-5 Resetting the energy counters for module version with 2 bytes of output data

Start values

After the reset, the energy counters count with the assigned start values (default = 0). You can change the start values for the energy counters via data record DS 143, for details see section Resetting energy counters and overflow counters by data set DS 143 (Page 49).

7.4.3 Resetting energy counters and overflow counters by data set DS 143

使用数据集ds143重置能量计数器和溢出计数器

Introduction

You can reset the energy counters and their overflow counters, for all module versions via the data record DS 143. Resetting is possible for:

- Energy counters and overflow counters for each phase separately
- Active, reactive and apparent energy counters.

步骤

Procedure for all module versions using data record DS 143

程序适用于所有使用数据记录ds143的模块版本

1. In Control byte 1 of DS 143, set the reset bit (Bit 2) to 1 and Bit 0 to 1 for the overflow counter. 在ds143的控制字节1中，将重置位(第2位)设置为1，将溢出计数器的第0位设置为1。
2. In Control byte 2 of DS 143, set the category of the energy counters (active, reactive, apparent energy) to 1 via Bits 5 to 7. 在ds143的控制字节2中，通过第5位到第7位将能量计数器(有功、无功、视在能)的类别设置为1。
3. In Control byte 1 of DS 143, set Bit 7 for when to apply the start values to the desired energy counters: 在DS 143的控制字节1中，设置第7位，以便在什么时候将起始值应用到所需的能量计数器:
   - Bit 7 to 0, if the start value is applied immediately after the transfer of the data record
   - Bit 7 to 1, if the start value is only applied after the reset bit has been set in the output data of the user data.

只有在重置时才会更新新的初始值

   In Control byte 1 of the DS 143, set the reset bit (Bit 2) to 1 and Bit 0 to 1 for the overflow counter.

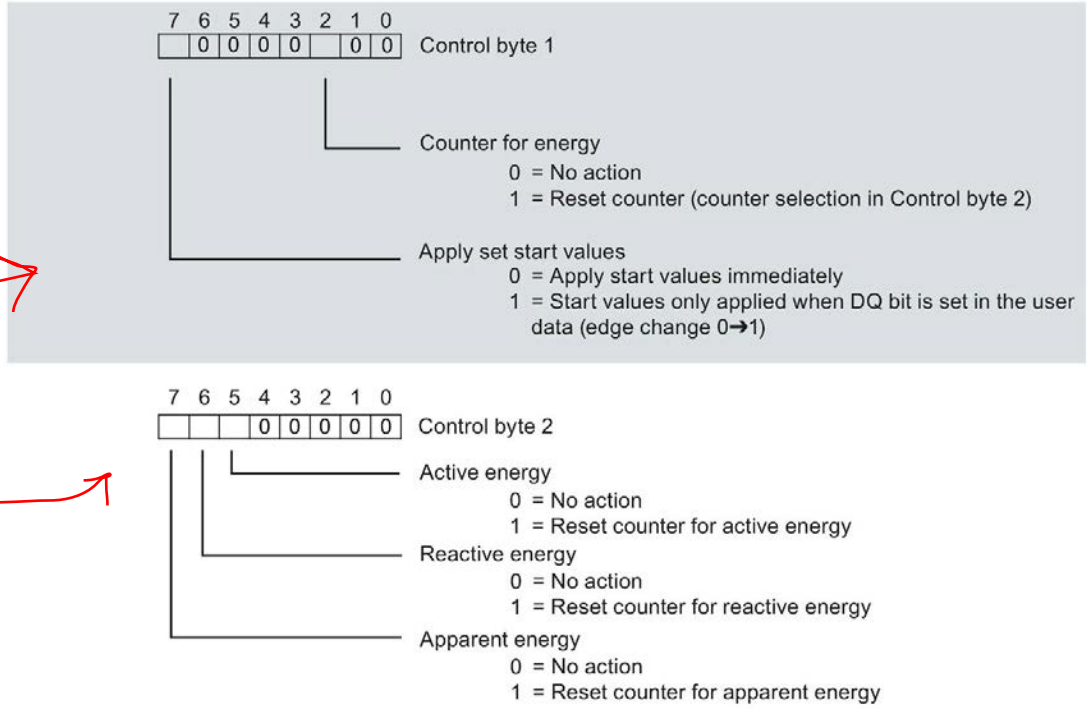

Figure 7-6 Energy counter control information DS 143

4. Transfer the data record with the WRREC instruction. 使用WRREC指令传输数据记录

Start values

You can control when the start values are applied in Control byte 1 via Bit 7. After the reset, the energy counters count with the assigned start values (default = 0) and the overflow counters begin again with 0. You can change the start values for the energy counters via data record DS 143.

您可以控制起始值何时通过第7位应用于控制字节1中。重置之后，能量计数器使用指定的起始值计数(默认值为0)，溢出计数器再次以0开始计数。您可以通过数据记录ds143更改能量计数器的起始值。

7.4.4 Example reset of energy counters and overflow counters by data set DS 143

Introduction

Before you can transfer the data record DS 143 to PLC memory, you have to create a user-defined PLC data type in your user program that has an identical structure to data record DS 143. 在将数据记录ds143传输到PLC内存之前，必须创建一个用户定义的与数据记录DS具有相同结构的用户程序中的PLC数据类型143.

Procedure

完全相同的数据结构

1. Create a PLC data type that has an identical structure to data record DS 143.

   Detailed information on the structure of data record 143 is available in section Structure of energy counter data DS 143 (Page 151).

Byte	Measured variable	Data type	Unit	Value range	Measured value ID
0	Version	BYTE	-	1	-
1	Reserved	BYTE	-	0	-
2	Control byte 1 - L1	BYTE	Bit string	-	-
3	Control byte 2 - L1	BYTE	Bit string		
4	Control byte 1 - L2	BYTE	Bit string		
5	Control byte 2 - L2	BYTE	Bit string		
6	Control byte 1 - L3	BYTE	Bit string		
7	Control byte 2 - L3	BYTE	Bit string		
8 ... 15	Active energy inflow (initial value) L1	LREAL	Wh	See Section Structure of energy counter data DS 143 (Page 151)	61180
16 ... 23	Active energy outflow (initial value) L1	LREAL	Wh		61181
:	:	:	:	:	:
162 ... 165	Operating hours counter L2 (initial value)	REAL	h	See Section Structure of energy counter data DS 143 (Page 151)	65506
166 ... 169	Operating hours counter L3 (initial value)	REAL	h		65507

2. Create a user-defined PLC data type and allocate the values of the data record in a DB or instance DB. 创建用户定义的PLC数据类型，并在数据库或实例数据库中分配数据记录的值

   Byte 0 and byte 1:

   Enter the value 01_H in Byte 0 and the value 00_H to Byte 1.

   Byte 2 ... byte 7: Control bytes for energy and overflow counter

   In the control byte for the respective phases, assign which energy and overflow counters that you want to reset.

   The control bytes assign each phase (L1, L2, L3) separately and which energy meter values to reset.

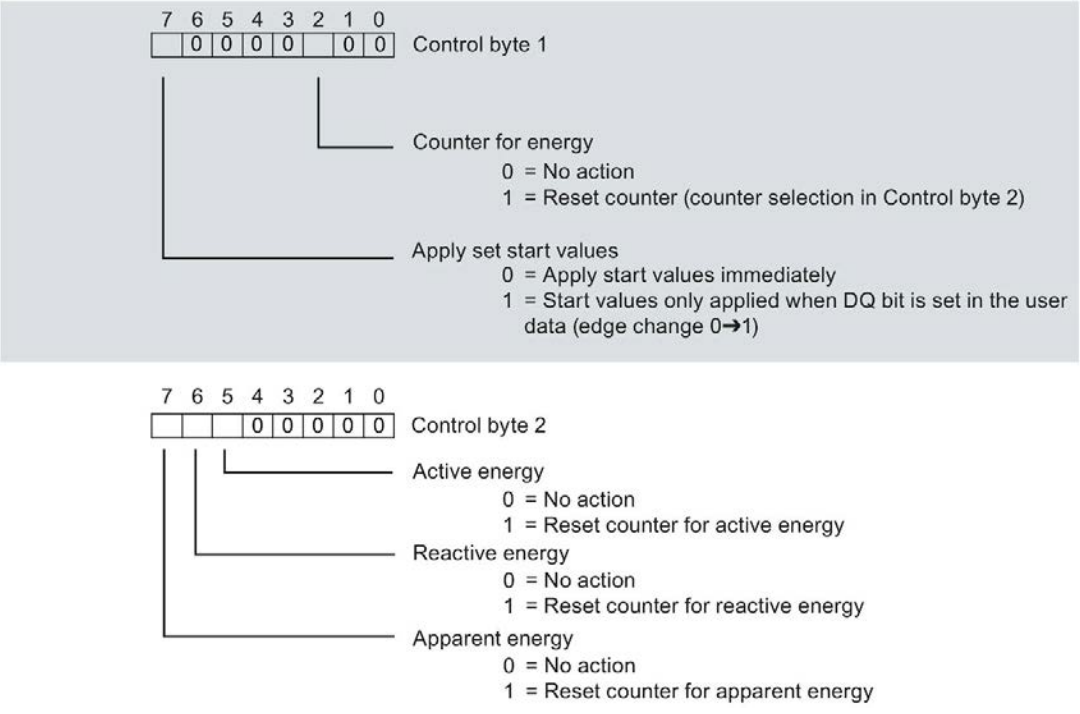

Figure 7-7 Control information DS 143 for energy and overflow counter

   Byte 8 ... byte 127: Start values for the individual energy meters 特别的能量表的起始值

   The start values for energy counters in data record 143 are 64-bit floating point numbers. This format corresponds to the data type LREAL in the S7-1200 CPU.
   数据记录143中的能量计数器的起始值是64位浮点数。
   这种格式对应于S7-1200 CPU中的数据类型LREAL

   Byte 128 ... byte 157: Initial values for overflow counters 溢出计数器的初始值

   The initial values for overflow counters in data record 143 are 16-bit integers. This format corresponds to the data type UINT in the S7-1200 CPU.

3. Write the data record to the SM 1238 Energy Meter 480VAC module using the "WRREC" instruction. 使用“ WRREC ”指令将数据记录写入SM 1238电能表480VAC模块。

   The input parameters must be allocated as follows:

   – REQ: A new write job is triggered if REQ = TRUE.
   – ID: Hardware identifier or start address of the Energy Meter (depending on the CPU used) 硬件标识
   – INDEX: The data record number: 143
   – LEN: The maximum length of the data record: 170 数据记录的最大长度
   – RECORD: A pointer to the data area in the CPU which includes data record 143 指向CPU中包含数据记录143的数据区域的指针

   Note

   If you want to write or read several SM 1238 Energy Meter 480VAC modules at the same time, do not exceed he maximum number of active communication jobs allowed with SFB52/SFB53. 如果要同时读写多个SM 1238电能表480VAC模块，请不要超过所允许的主动通信作业的最大数量SFB52 / SFB53。

7.5 Data record for energy counters (DS 143) 能源计数器的数据记录(ds143)

7.5.1 Structure of energy counter data DS 143

Using energy meter data record 143

The energy meter data record 143 includes all energy counters available on the module phase-by-phase. The data record can be used for different actions:

- Reset the energy counter to an assigned value (e.g. "0")
- Read the values of the energy counters
- Read the overflow counters
- Read the operating hours

Energy meter data record 143

Table 7- 1 Energy meter data record 143

Byte	Measured variable	Data type	Unit	Value range	Measured value ID
0	Version	BYTE	-	1	-
1	Reserved	BYTE	-	0	-
2	Status / control byte 1 - L1	BYTE	Bit string	-	-
3	Status / control byte 2 - L1	BYTE	Bit string		
4	Status / control byte 1 - L2	BYTE	Bit string		
5	Status / control byte 2 - L2	BYTE	Bit string		
6	Status / control byte 1 - L3	BYTE	Bit string		
7	Status / control byte 2 - L3	BYTE	Bit string		
8 ... 15	Active energy inflow (initial value) L1	LREAL	Wh	During reading: 0.0 ... 1.8 x 10^{308} During writing For continuous counting: 0.0 ... 3.4 x 10^{12} During writing For periodic counting: 0 ... configured full-scale value (10^3 ... 10^{15} Wh)	61180
16 ... 23	Active energy outflow (initial value) L1	LREAL	Wh		61181
24 ... 31	Reactive energy inflow (initial value) L1	LREAL	varh		61182
32 ... 39	Reactive energy outflow (initial value) L1	LREAL	varh		61183
40 ... 47	Apparent energy (initial value) L1	LREAL	VAh		61184
48 ... 55	Active energy inflow (initial value) L2	LREAL	Wh		61200
56 ... 63	Active energy outflow (initial value) L2	LREAL	Wh		61201
64 ... 61	Reactive energy inflow (initial value) L2	LREAL	varh		61202
72 ... 79	Reactive energy outflow (initial value) L2	LREAL	varh		61203
80 ... 87	Apparent energy (initial value) L2	LREAL	VAh		61204
88 ... 95	Active energy inflow (initial value) L3	LREAL	Wh		61220
96 ... 103	Active energy outflow (initial value) L3	LREAL	Wh		61221
104 ... 111	Reactive energy inflow (initial value) L3	LREAL	varh		61222
112 ... 119	Reactive energy outflow (initial value) L3	LREAL	varh		61223
120 ... 127	Apparent energy (initial value) L3	LREAL	VAh		61224

Byte	Measured variable	Data type	Unit	Value range	Measured value ID
128 ... 129	Overflow counter active energy inflow L1	UINT	-	During reading: 0 ... 65535 During writing for continuous counting: 0 During writing for periodic counting: 0 ... 65500	61190
130 ... 131	Overflow counter active energy outflow L1	UINT	-		61191
132 ... 133	Overflow counter reactive energy inflow L1	UINT	-		61192
134 ... 135	Overflow counter reactive energy outflow L1	UINT	-		61193
136 ... 137	Overflow counter apparent energy L1	UINT	-		61194
138 ... 139	Overflow counter active energy inflow L2	UINT	-		61210
140 ... 141	Overflow counter active energy outflow L2	UINT	-		61211
142 ... 143	Overflow counter reactive energy inflow L2	UINT	-		61212
144 ... 145	Overflow counter reactive energy outflow L2	UINT	-		61213
146 ... 147	Overflow counter apparent energy L2	UINT	-		61214
148 ... 149	Overflow counter active energy inflow L3	UINT	-		61230
150 ... 151	Overflow counter active energy outflow L3	UINT	-		61231
152 ... 153	Overflow counter reactive energy inflow L3	UINT	-		61232
154 ... 155	Overflow counter reactive energy outflow L3	UINT	-		61233
156 ... 157	Overflow counter apparent energy L3	UINT	-		61234
158 ... 161	Operating hours counter L1 (initial value)	REAL	h	During reading: 0 ... 3.4×10^{38} During writing: 0 ... 10^9	65505
162 ... 165	Operating hours counter L2 (initial value)	REAL	h		65506
166 ... 169	Operating hours counter L3 (initial value)	REAL	h		65507

Status information

When data record 143 is read with the RDREC instruction, Bytes 2 to 7 supply phase-specific status information for energy counters, overflow counters, and operating hours counters.

The status information shows which counters are returning values in data record 143. If energy counters return values in the status byte 1, you can determine the type of energy counter with status byte 2.

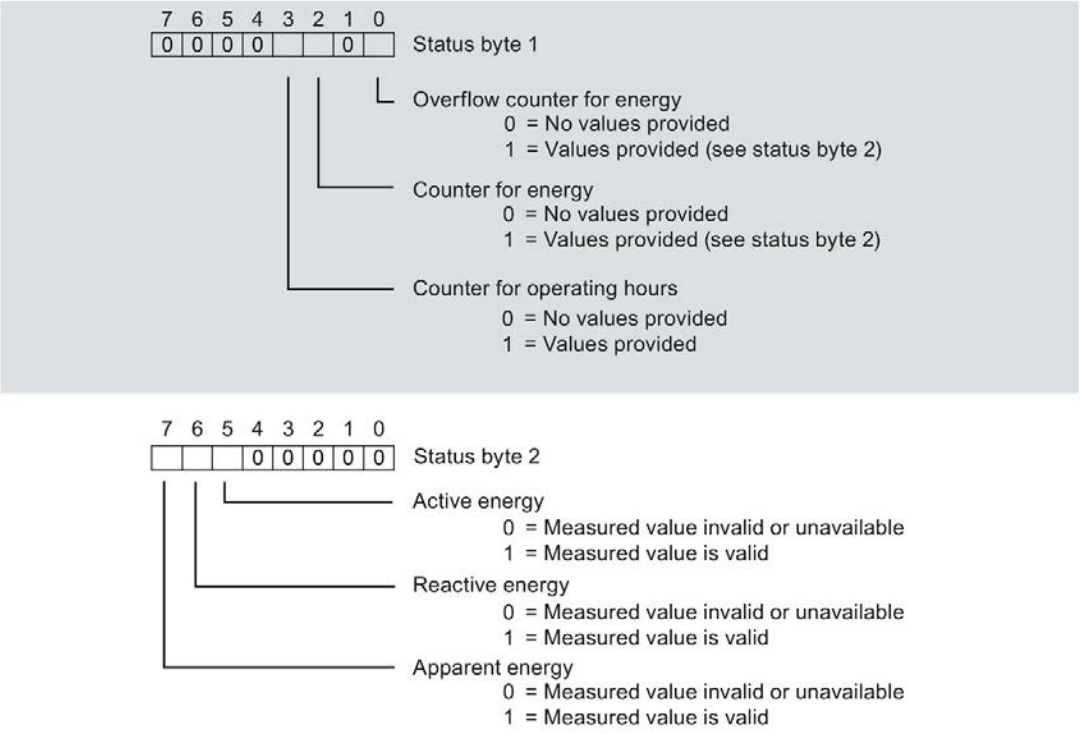

Figure 7-8 Status information DS 143