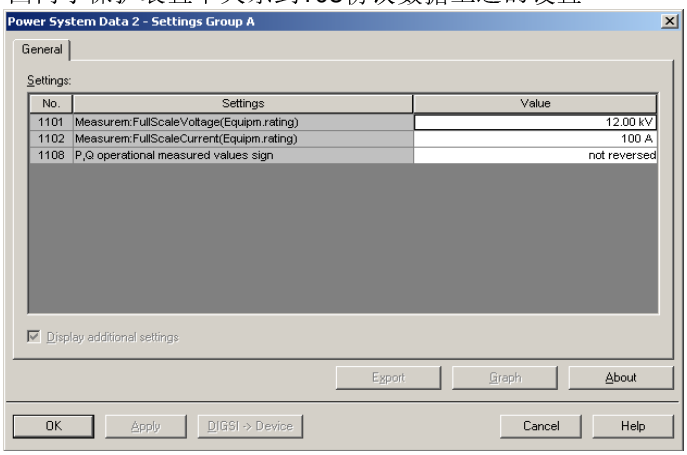
FAQ-4845

Question:

IEC103主站应如何计算西门子装置上送的测量值和计量值。

Answer:

1）西门子保护装置中关系到103协议数据上送的设置



电力系统数据2中的1101（电压满刻度）和1102（电流满刻度）是主站计算的基准，建议此处设置与PT，CT变比相同。

2）如何计算测量值

$$\text{线电压} = \frac{\text{码值}}{32768} \times 2.4 \times \text{电压满刻度（参数1101）}$$

$$\text{相电压} = \frac{\text{码值}}{32768} \times 2.4 \times \frac{\text{电压满刻度（参数1101）}}{\sqrt{3}}$$

$$\text{电流} = \frac{\text{码值}}{32768} \times 2.4 \times \text{电流满刻度（参数1102）}$$

$$\text{频率} = \frac{\text{码值}}{32768} \times 2.4 \times \text{系统频率（50Hz或60Hz）}$$

$$\text{功率} = \frac{\text{码值}}{32768} \times 2.4 \times \sqrt{3} \times \text{电压满刻度（参数1101）} \times \text{电流满刻度（参数1102）}$$

$$\text{功率因数} = \frac{\text{码值}}{32768} \times 2.4 \times 1$$

注：码值即103报文中16位（包含品质位）报文（ASDU03或ASDU09）计算出的十进制值。

3）如何计算计量值

$$\text{电度量} = \text{码值} \times \frac{\sqrt{3} \times \text{电压满刻度（参数1101）} \times \text{电流满刻度（参数1102）}}{60000}$$

注：码值即103报文中32位报文（ASDU205）计算出的脉冲个数

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4）示例：

ASDU09：

68 28 28 68 08 11 09 0e 02 11 86 89 b0 1a d0 1a a0 19 00 00 e0 37 20 38 b8 37 08 38 e0 37 e0 37 c8 14 70 12 40 35 d7 27 5c 16

Ia Ib Ic Va Vb Vc Vab Vbc Vca P Q F PF

根据第一步中定值及第二步的公式

Uab = $\frac{Hex3808}{32768}\times 2.4\times 12 = \frac{14344}{32768}\times 2.4\times 12$ = 1.05*12 =12.6kV

Ubc = $\frac{Hex37e0}{32768}\times 2.4\times 12 = \frac{14304}{32768}\times 2.4\times 12$ = 1.047*12 = 12.57kV

Uca = $\frac{Hex37e0}{32768}\times 2.4\times 12 = \frac{14304}{32768}\times 2.4\times 12$ = 1.047*12 = 12.57kV

Ua = $\frac{Hex37e0}{32768}\times 2.4\times \frac{12}{\sqrt{3}} = \frac{14304}{32768}\times 2.4\times \frac{12}{\sqrt{3}}$ = 1.047* 6.9= 7.25kV

Ub = $\frac{Hex3820}{32768}\times 2.4\times \frac{12}{\sqrt{3}} = \frac{14368}{32768}\times 2.4\times \frac{12}{\sqrt{3}}$ = 1.05* 6.9= 7.26kV

Uc = $\frac{Hex37b8}{32768}\times 2.4\times \frac{12}{\sqrt{3}} = \frac{14264}{32768}\times 2.4\times \frac{12}{\sqrt{3}}$ = 1.04* 6.9= 7.21kV

Ia = $\frac{Hex1ab0}{32768}\times 2.4\times 100 = \frac{6832}{32768}\times 2.4\times 100$ = 0.5*100 = 50A

Ib = $\frac{Hex1ad0}{32768}\times 2.4\times 100 = \frac{6864}{32768}\times 2.4\times 100$ = 0.5*100 = 50A

Ia = $\frac{Hex19a0}{32768}\times 2.4\times 100 = \frac{6560}{32768}\times 2.4\times 100$ = 0.48*100 = 48A

F = $\frac{Hex3540}{32768}\times 2.4\times 50 = \frac{13632}{32768}\times 2.4\times 50$ = 0.998*50 = 49.9Hz

P = $\frac{Hex14c8}{32768}\times 2.4\times \sqrt{3}\times 12\times 100 = \frac{5320}{32768}\times 2.4\times \sqrt{3}\times 12\times 100$ = 0.389*2.0784 = 0.81MW

Q = $\frac{Hex1270}{32768}\times 2.4\times \sqrt{3}\times 12\times 100 = \frac{4720}{32768}\times 2.4\times \sqrt{3}\times 12\times 100$ = 0.345*2.0784 = 0.72MVar

PF = $\frac{Hex27d7}{32768}\times 2.4\times 1 = \frac{10199}{32768}\times 2.4\times 1$ = 0.746*1 =0.746

ASDU205:

68 10 10 68 28 02 CD 81 01 02 85 34 26 34 1E 00 1D 00 0F 11 E9 16

Wqforward = $Hex001e3426\times\frac{\sqrt{3}\times 12\times 100}{60000} = 1979430\times\frac{\sqrt{3}\times 12\times 100}{60000}$ = 68.56MVarH

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1 Warnings

WARNING

Dangerous voltages may occur in devices and modules during operation depending on the design and application. Incorrect use of these devices can therefore result in severe personal injury or substantial damage to property.

Only suitably qualified staff should work on this device.

Correct and safe operation of this device is dependent on proper handling, installation, operation and maintenance.

Should you require further information, or should particular problems occur which are not handled in sufficient depth in the Instructions, help can be requested through your local Siemens Office or representative.

QUALIFIED PERSON

A "qualified person" is one who is familiar with the installation, construction and operation of the device and who has the appropriate qualifications, e.g.

- is trained and authorized to operate and maintain devices/systems in accordance with established safety practices for devices with electrical circuits.
- is trained in the proper care and use of protective equipment in accordance with established safety practices.
- is trained in first aid.

Subject to change without prior notice !