Low-Power Sensors for 7SC80

The 7SC80 can be ordered with low power current and voltage sensor inputs.

The corresponding MLFB versions are:

For LoPo current sensors (LPS): 7SC8021-xxx

For LoPo current and voltage sensors (LPS): 7SC8023-xxx

The following describes the different inputs in detail to choose the right LoPo sensor for the given application in your projects and provides some recommendations for sensors and how to order them.

CT- LPS input in 7SC80

With order options mentioned above, 7SC80 is equipped with CT inputs which measure AC voltage instead of standard 1A/5A inputs. This measured AC voltage is equivalent to the primary current. The sensors are interfaced to the 7SC80 with open ended shielded wires.

The measurement range of CT-LPS inputs in 7SC80 is 20mV…50V, input impedance is 40kOhm

The rated voltage is 200mV to 20V for nominal current in 7SC80 parameter set

Thermal load capacity: 200V for 10 seconds
100V continuous

Measurement accuracy: +/- 1mV constant at 25°C

Lowest measurement level is 20mV, this result in an accuracy of +/- 5% at 20mV

Measurement level at 225mV, accuracy is +/-0,5%

All kind of CT sensors of several vendors can be connected which fulfills the mentioned conditions above.

Attention: It has to be ensured to use only sensors in your network, which are able to handle the expected short circuit current.

Possible LoPo CT sensors for 7SC80

Zelisko Sensors for cable networks:

The Zelisko split-core phase sensor has a ratio of 225mV/300A

The Zelisko core balance current sensor has a ratio of 225mV/60A

Both current sensors can be ordered via MLFB in Berlin directly.

The Zelisko Sensors are available in several variants; please contact your local Zelisko Sales department, to ask for other sensor versions.

Lindsey Line Post Sensors for cable and overhead networks:

Lindsey offers a wide range of different current sensors for overhead as well as for cable networks. Combined CT and VT (multicore) sensors are available as well; please have a look in the different data sheets.

Typical ratio is 10V/600A

VT-LPS input in 7SC80

In all 7SC80 variants VT-LPS sensors can be connected to the standard voltages interfaces. The switchover between the different voltage ranges is done by device firmware, no special order variant necessary. This measured AC voltage is equivalent to the primary voltage. The sensors are interfaced to the 7SC80 with open ended shielded wires.

The measurement range of VT-LPS inputs is 100mV…250V, input impedance is 1.2MOhm

The rated voltage is 200mV to 40V for nominal voltage

Thermal overload capacity: 230V continuous

Measurement accuracy: +/-1mV constant at 25°C

Lowest measurement level is 100mV, this result in an accuracy of +/-1% at 100mV

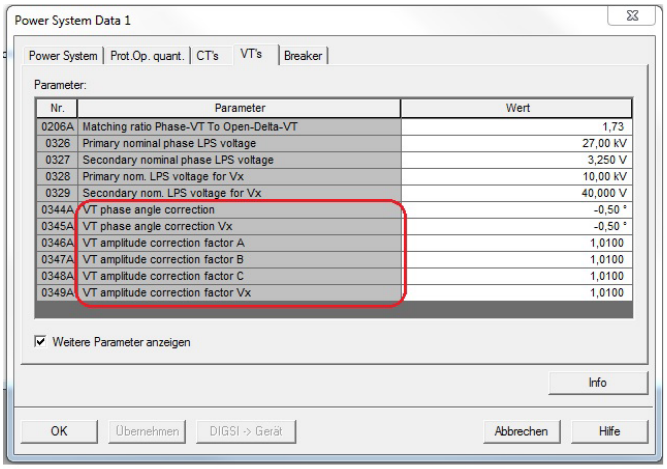
All kind of VT sensors from several vendors can be connected which fulfills the mentioned conditions above.

Possible LoPo VT sensors for 7SC80

Zelisko Sensors for cable networks:

The Zelisko Sensor for elbow mounting has a secondary voltage of 3,25V/$\sqrt{3}$. Nominal voltages are 10kV/$\sqrt{3}$ and 20kV/$\sqrt{3}$.

These VT sensors need VT input impedance of 200 kOhm, the mismatch to 7SC80 VT input of 1.2 MOhm will be corrected in 7SC80 firmware by phase angle/amplitude adjustment.



Both voltage sensors variants can be ordered via MLFB in Berlin directly.

Lindsey Line Post Sensors for cable and overhead networks:

Lindsey offers a wide range of different voltage sensors for overhead as well as for cable networks. Combined CT and VT (multicore) sensors are available as well; please have a look in the different data sheets.

How to order

Zelisko sensors:

Some of the above described sensors can be ordered via MLFB in Berlin directly.

Typical Ordering combinations	Description	MLFB-Number	List price per unit EURO
Phase current sensor	Type 225mV@300A IEC60044-8 Split core; Window diameter 52mm	6MD2320-0GA00-1AA0	80.00
Core balance current sensor	Type 225mV@60A IEC60044-8 Split core; Window diameter 110mm	6MD2320-0AF00-1AA0	290.00
Voltage Sensor 10kV	10kV/√3 ➔ 3.25/√3 IEC60044-7 for T-connector with C-cone	6MD2320-0AA04-1AA0	245.00
Voltage Sensor 20kV	20kV/√3 ➔ 3.25/√3 IEC60044-7 for T-connector with C-cone	6MD2320-0AA07-1AA0	265.00

Zelisko is located in Austria and has several sales offices worldwide; contact data are available via http://www.zelisko.at/en/products/energy/contact_2/contact_2.jsp

Lindsey sensors:

Lindsey is located in USA only. For all requests for proposal all over the world, please contact the Sales representative Philip Spillane directly via email: pspillane@lindsey-usa.com

Pricing:

At the moment a complete price list is not available, it would be long and complicated as the ranges of outputs for either voltage measurement or current measurement are driven by the measurement or control device that is attached.

Lindsey quotes and builds to the specific requirement which also includes connecting cable length and connector preference individually.

In the following some examples:

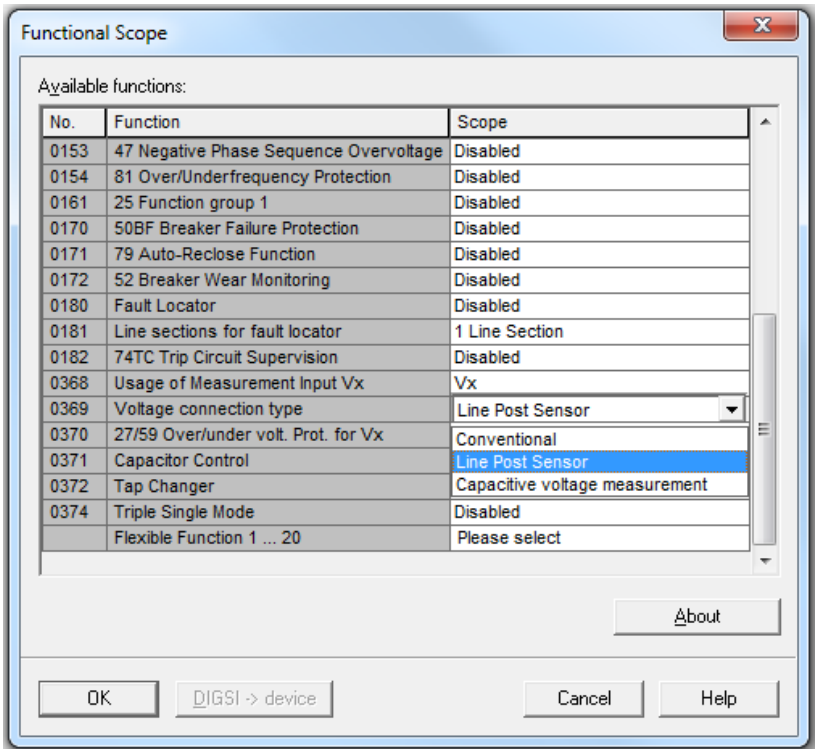
Voltage Sensing Plug for underground $695.00 USD

Voltage Sensing Plug Connector and 10 foot Connecting Cable $27.00 USD

CT 600A=10V AC output for underground $325.00 USD

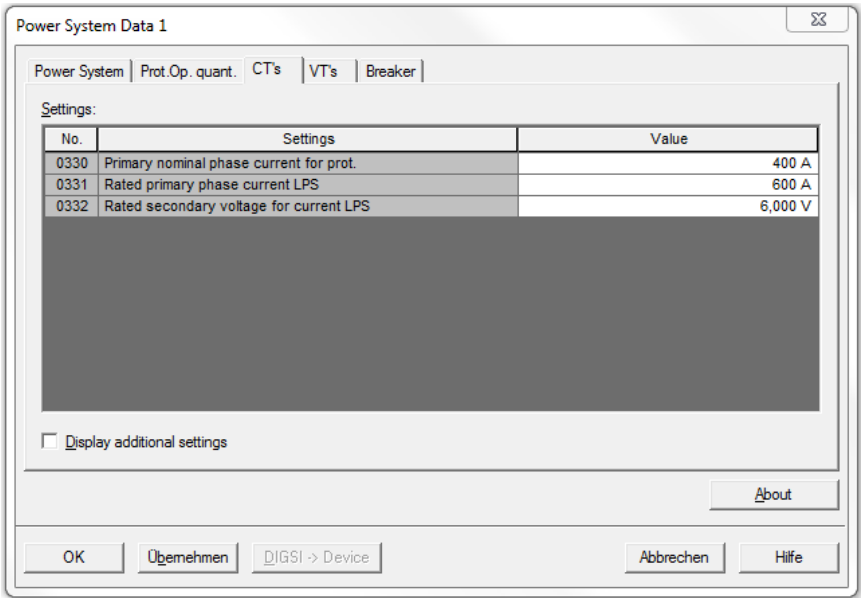
Configuration of 7SC8023 with DIGSI:

After choosing the LoPo CT via MLFB variant, the usage of LoPo VTs have to be activated in functional Scope menu in DIGSI, see picture below.

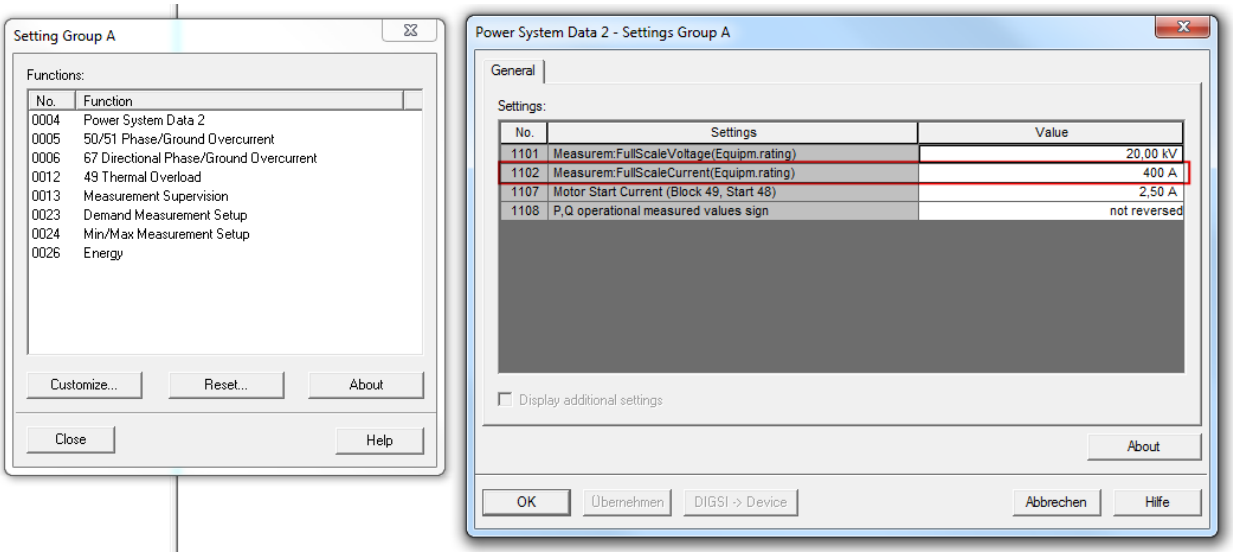


Parameter 0369 “voltage connection type” has to be set to “Line Post Sensor”.

The following settings refer to a Lindsey CT sensor with 6V/600A and nominal primary current of 400A. Please adapt the settings for other sensors accordingly.
Open the “power system data 1” menu and switch to tab “CT’s”. And set the values as in the picture below:



With parameter 330 “primary nominal phase current” the nominal current is set. In the device the 400A primary current is shown as 1A secondary and as 400A primary. The 100 percentage value can be adapted “power system data 2” (access: Setting group -> Power system data 2). Here the 400A are 100%.



The following settings refer to a Lindsey VT sensor. Please adapt the settings for other sensors accordingly:

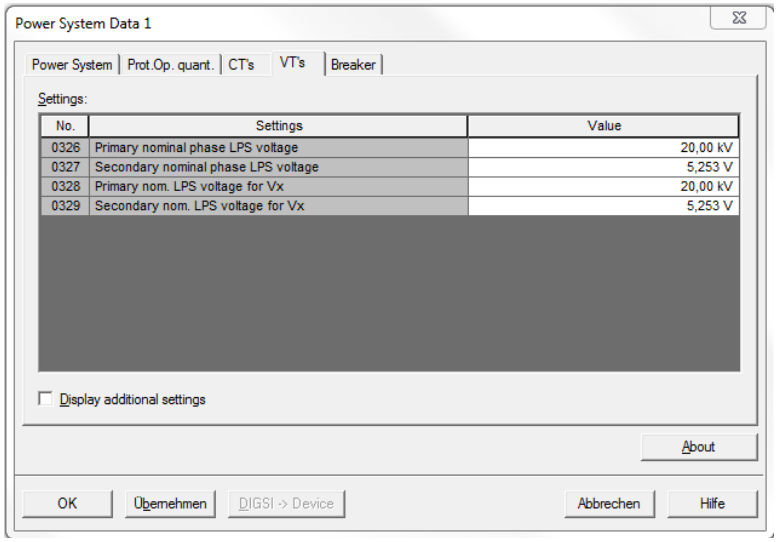
Voltage Monitoring Insulators (SVMI) Insulation Class 25 kV

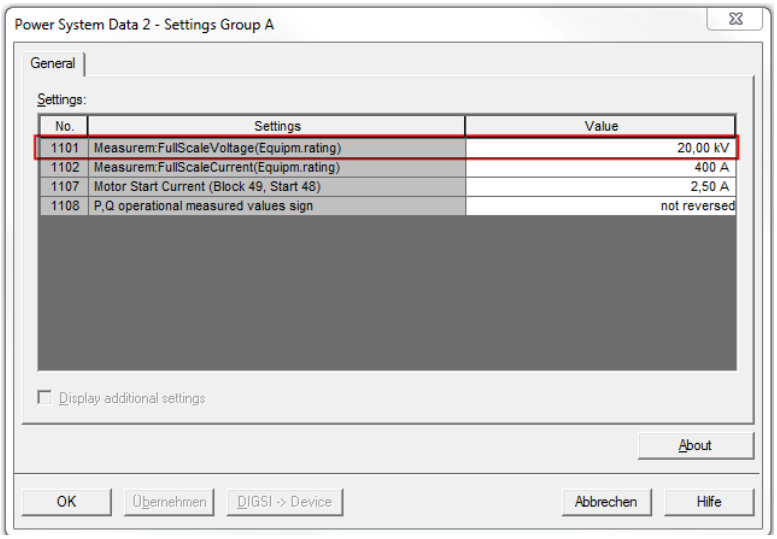
Operating Voltage L – L [kV]	Operating Voltage L – G [kV]	AC Output Voltage [V]	Load (instrument) Impedance Greater Than	Lindsey Part Number
24.94	14.4	120	1 M	9326
24.94	14.4	120	500k	932X/120/500k
16.42	9.48	120	5 M	932X/79/5M
17.3	10.0	120	1.4 M	932X/83.3/1.4M
23.0	13.28	120	1 M	932X/110.6/1M
24.94	14.4	6.55	1 M	932X/2200/1M

In the following example the primary nominal voltage is 20kV (L-L).
For parameter 326 “primary nominal phase LPS voltage” use the phase voltage 20kV and for parameter 327 “secondary nominal phase LPS voltage” use the calculated value:

$$\text{Usec} = \frac{20\text{kV x } 6{,}55\text{V}}{24.94\text{kV}} = 5{,}253\text{V}$$

The 20kV primary nominal voltage is shown in the device as 100V secondary voltage. The protection functions have to be set accordingly. Therefore the 100V are equal to 100%.





The following protection example shows the over voltage function 59 with 10% overvoltage threshold (equal to 110V)