

# LLX Low Level Output Accessories for CMC 500 and CMC 430 Test Sets



## LLX – Low level output accessories for CMC 500 and CMC 430

LLX accessory units are used to expand CMC 500 and CMC 430 test sets with six low level outputs. They are connected to one of the expansion ports of the test set, which powers and controls them.

LLX can be used for testing devices with sensor inputs by simulating the output signals of low power voltage and current sensors, such as voltage dividers, Rogowski coils or low power CTs. Unique is that Rogowski coil signals can be simulated not only in the steady state but also for transients. LLX can also be used to control external amplifiers like CMS 356.

To accommodate the requirements of different applications LLX is available in three different types.

### LLX1 – Testing devices with sensor inputs

### Item no. P0006381





In addition to simulating the phase voltages and currents, LLX1 is also capable of simulating residual voltage and current for dedicated inputs.

A wide range of cables are available for easily connecting LLX1 to different devices that have specific connectors and pinouts.



| Cable type | Suitable for   | Connector type | Item no. |
|------------|--|----------------|----------|
| LAB1       | ABB Relion 615, 620 (w. SIM0002)<br>ABB REX640 (w. SIM1901)  | RJ45           | B1960000 |
| LAB2       | ABB REF542plus   | 2x Twin-BNC    | B1960100 |
| LAB3       | ABB CSU-2  | RJ45           | B2139500 |
| LSE1       | Schneider Electric Sepam   | RJ45           | B1960300 |
| LSE2       | Schneider Electric Easergy<br>Schweitzer Engineering Laboratories SEL-751  | 2x RJ45        | B1960500 |
| LSI1       | Siemens Siprotec 4 Compact   | RJ45           | B1960200 |
| LST1       | Devices acc. to IEC 61869-10/-11, e.g.<br>ABB Relion 615, 620 (w. SIM0005)<br>ABB REX640 (w. SIM1902)<br>Siemens 7SY82<br>Sprecher Automation SPRECON-EDIR | RJ45           | P0008935 |





<sup>1</sup> All cables have a length of 2.5 meters (8.2 ft)



### LLX2 – Low level interface for external amplifiers and accessories

Item no. P0006382



LLX2 provides a standard low level interface for controlling external amplifiers such as the CMS 356 and other low level accessories with a 16-pin LEMO-type connector.

### LLX3 - Versatile low level outputs with 4 mm sockets

Item no. P0006383



LLX3 provides low level outputs using standard 4 mm sockets. This makes LLX3 a flexible solution for further applications such as experimental setups.

- Adds 6 low level outputs to CMC 500 and CMC 430 test sets
- Powered and controlled from Expansion Port
- > Unique simulation of Rogowski-coil signals



## Technical specifications<sup>1</sup>

### Voltage outputs

| Number of outputs    | 6 <sup>2</sup>     |  |
|----------------------|--------------------|--|
|                      |                    |  |
| Range                | LLX                |  |
| 0 0.8 V              | All                |  |
| 08V                  |                    |  |
| 0 24 V               | LLX1 and LLX3 only |  |
| 0 1.6 V <sup>3</sup> |                    |  |
| 0 16 V <sup>3</sup>  | LLX1 only          |  |
| 0 48 V <sup>3</sup>  |                    |  |

### **Environmental conditions**

| Operating temperature                  | -25 +50 °C / -13 + 122 °F |  |
|--|---------------------------|--|
| Storage and transportation temperature | -40 +70 °C / -40 + 158 °F |  |
| Relative humidity                      | 5 95 %, no condensation   |  |
| Max. altitude for operating            | 4000 m / 13000 ft         |  |
| Max. altitude for non-operating        | 15000 m / 49000 ft        |  |

#### Weight and dimensions

| Weight                 | 0.9 kg / 2.0 lbs                       |
|------------------------|--|
| Dimensions (W x H x D) | 142 x 55 x 178 mm / 5.6 x 2.2 x 7.0 in |

#### Voltage amplitude accuracy at a frequency of 50/60 Hz

| Range           | 1 year <sup>4</sup> | 2 years <sup>4</sup> |
|-----------------|---------------------|----------------------|
| 0.8 V and 1.6 V | 0.07 % + 0.03 %     | 0.13 % + 0.03 %      |
| 8 V and 16 V    | 0.06 % + 0.02 %     | 0.10 % + 0.02 %      |
| 24 V and 48 V   | 0.14 % + 0.02 %     | 0.24 % + 0.02 %      |

### General amplifier specifications

| Frequency range                     | Sine signals                                | DC 1000 Hz       |
|-------------------------------------|---|------------------|
|                                     | Harmonics,<br>Interharmonics,<br>Transients | DC 3000 Hz       |
| Phase accuracy<br>50/60 Hz (ref V1) |   | 0.02° guaranteed |

<sup>1</sup> Unless otherwise stated all specifications are valid after a 30 min. warm-up at 23 °C ±5 °C / 73 4°F ±9 °F and at a relative humidity of < 80 %.

<sup>2</sup> LLX1 has two additional outputs to simulate automatically calculated residual voltage and/or current.
<sup>3</sup> Only for low level outputs 4-6 with signal-type "differential".

 $^{4}$  ± (% of set value + % of range) or better

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Within the OMICRON group, we research and develop innovative technologies for all fields in electric power systems. When it comes to electrical testing for medium- and high-voltage equipment, protection testing, digital substation testing solutions, and cybersecurity solutions, customers all over the world trust in the accuracy, speed, and quality of our user-friendly solutions.

Founded in 1984, OMICRON draws on their decades of profound expertise in the field of electric power engineering. A dedicated team of more than 1250 employees provides solutions with 24/7 support at 22 locations worldwide and serves customers in more than 170 countries.



The following publications provide further information on the solutions described in this brochure:



CMC 500

For more information, additional literature, and detailed contact information of our worldwide offices please visit our website.