

Reliable cable selection for de-energised and energised (live) cables

- Identification and selection of cables
- Suitable for LV and MV cables
- Long-standing, industry-trusted system
- Cost-effective
- Compact and lightweight
- Safe operation
- Easy to use
- Rated IP 54



Reliable cable selection for de-energised and energised (live) cables

Functional description

A clear and unambiguous identification of a power cable before cutting or jointing is of paramount importance for safety. Any mistakes can lead to significant property damage, personal injury, or even the death of the cable technician. Additionally, an incident often results in unplanned in-service outages for connected customers. The CI/LCI system has been developed to make the task of cable identification and selection significantly safer and easier.

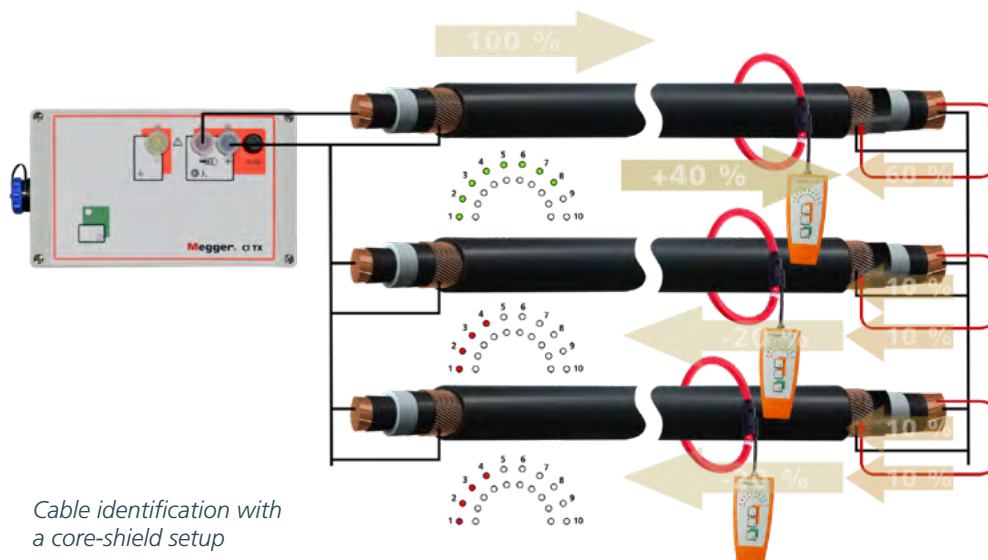
The CI/LCI solution consists of a generator unit for sending defined impulses, and a receiver unit for picking up impulses. This receiver, CI RX, is connected via a flex clamp (AZF 150-CI or AZF 250-CI) to decouple the transmitter signal sent by the generator into the cable. The generator, CI TX-1, emits single impulses with a peak current of up to 100 A. The current flow of these impulses generates an electromagnetic field with a well-defined polarity all around the connected power cable. This field will be detected by the flex coupler of the receiver CI RX and is also automatically synchronised and displayed on the LED indicator scale. The only adjustment required is the displayed signal sensitivity.

The following parameters are analysed to differentiate the useful signal from interference:

- Impulse shape
- Polarity
- Amplitude
- Frequency (intervall of 2 seconds)

The combination of employing a directional clamp and monitoring a set of impulse parameters ensures safe and consistent cable identification and selection, regardless of any interferences.

The user simply needs to verify the displayed signals for plausibility. Typically, only one of the conductors or cores will display the correct polarity, while all other cables show the opposite polarity (look for the „odd one out“ or „no signal“). Any deviations from this norm should be addressed immediately by checking the entire setup.



Cable identification with a core-shield setup

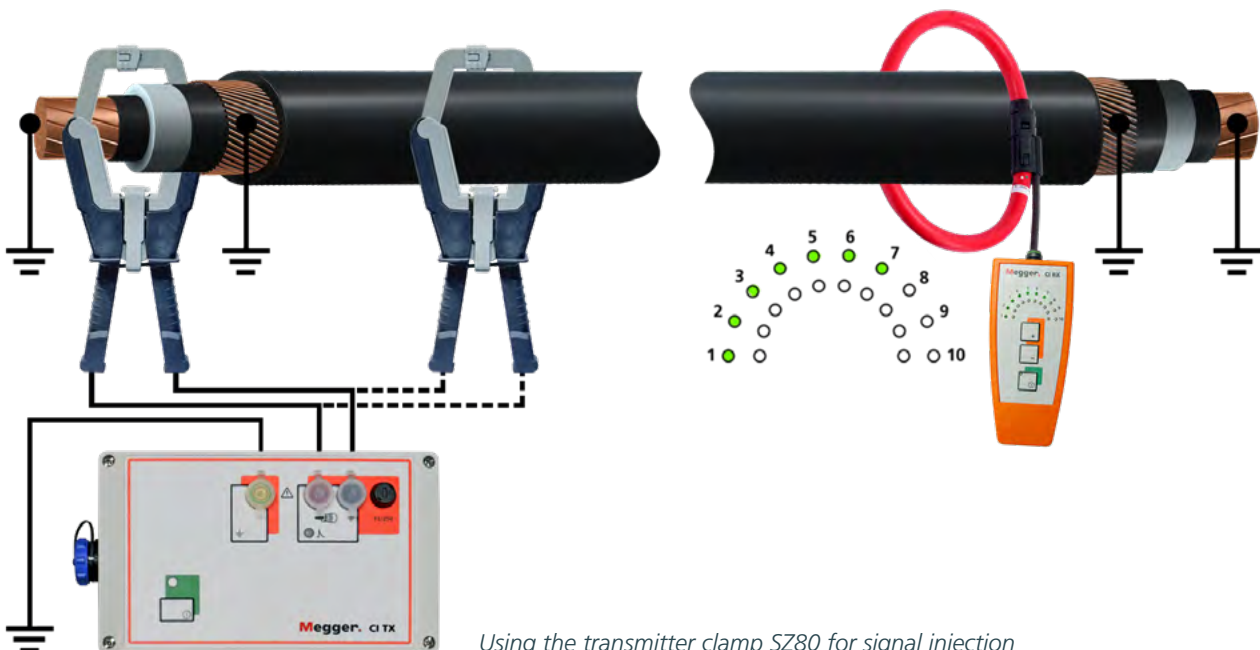
Medium voltage applications and identification of de-energised cables

Electrical tasks in medium voltage installations, such as cable testing, diagnostics, and fault location, must be performed with the circuit switched off and the cables de-energised.

The CI TX-1 generator serves this purpose as an active transmitter, emitting pulses of up to 100 A. It can be powered by mains input or by an internal accumulator (rechargeable battery) offering a flexible 4 hours of operating time on a full charge. Signals can be directly injected into the cable via galvanic connection or inductively using the optional SZ 80 transmitter clamp.



Signal pick-up: application of CI RX receiver unit and AZF flex clamp



Using the transmitter clamp SZ80 for signal injection

Clear identification with the twisted field sensor

Low voltage applications and identification of energised cables

When working with low-voltage installations, electrical tasks are often carried out under live conditions, with the cables still energised. The challenge is achieving dependable and consistent cable identification without interference from the supply voltage and without impacting any equipment like smart meters or distribution cabinets.

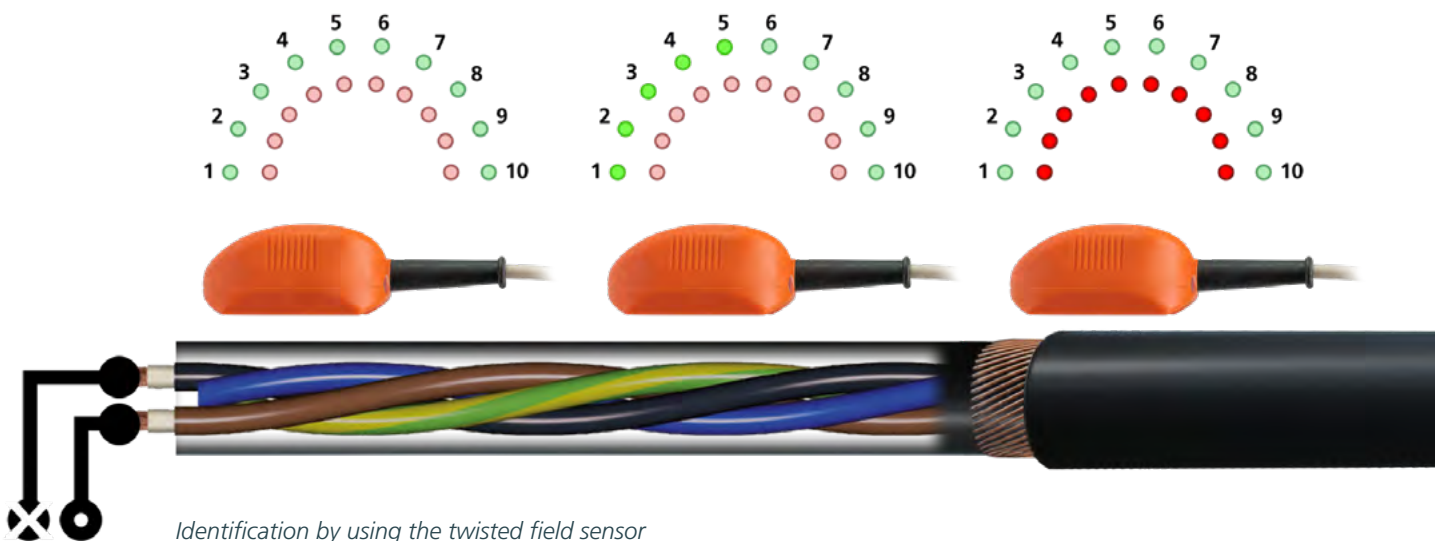
For this purpose, the LCI TX generator is connected to the 120 V or 230 V AC mains supply as applicable, through a protective earth lead. The LCI TX loads the feeder transformer with a current draw of approximately 80 A at regular 2-second intervals. This causes an impulse current in that section of the LV cable, which can be detected by the flex clamp receiver unit, facilitating the identification of that cable section. The device features two LEDs to indicate correct connection polarity, ensuring safe connection particularly for Schuko sockets. Note: This method does not work for IEC 60364 IT-type low voltage installations.

Identification in TT- and IT-type LV installations

Identification and selection in TT- and IT-type low-voltage installations must be carried out between two phases and via the twisted field method, where applicable. For this, the generator LCI TX 440 can be connected phase-to-phases up to 440 V, provided the current can flow through the feeder transformer.

Using the twisted field sensor TFS CI, the correct phase can be directly identified through the outer sheath of the cable. For enhanced consistency, the flex clamp receiver unit may be employed first to identify the cable, followed by the selection of the specific phase inside.

If needed, the sheath can be opened to expose and identify the correct phase before any cutting or further work is undertaken. This procedure has proven to be helpful when dealing with unmarked cores in PILC cables.





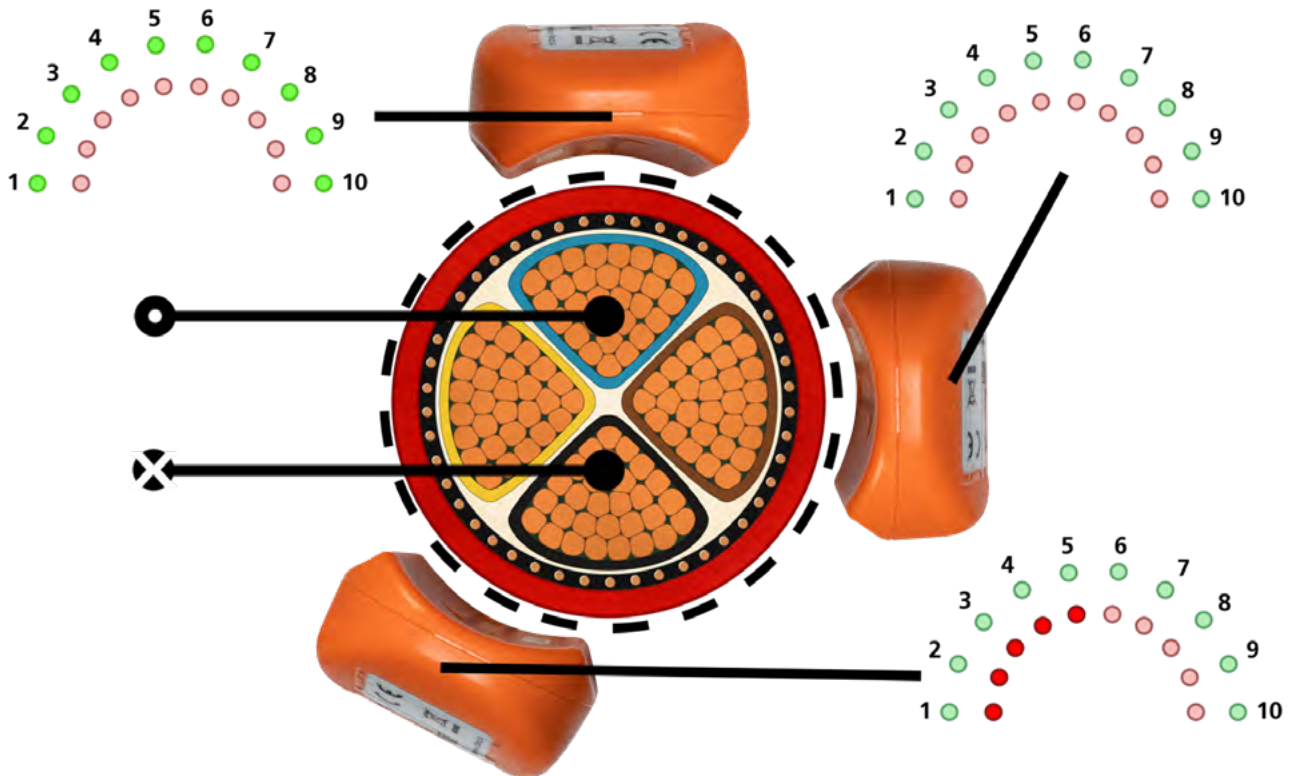
Advantages

Benefits of the twisted field method when injecting current impulses

In contrast to the conventional twisted field method utilising audio frequency, injecting current impulses and measuring the twisted field, e.g. with the TFS CI twisted field sensor, significantly improves cable identification. This method delivers a sharply defined positive signal maximum on the injected phase and a negative signal maximum on the return path. Unlike with the audio frequency method, uninjected conductors carry no detectable signal. The twisted field identification is compatible with both the standard generator CI TX-1 and the LCI TX-1 when connected L-N.

For connections to open and exposed distribution cabinets, safety clamps equipped with an integrated CAT IV / 600 V compliant fuse are available. For direct connections to NH fuses, there is an optional NH adapter that can be mounted on the NH fuse. This adapter, protected by an internal 6 A fuse, can connect directly to the LCI TX 440. Alternatively, it can be attached to the safety clamp of the LCI TX-1 by means of a screw-in adapter. The compact size of the generator units ensures good handling, even in restricted distribution cabinets.

Illustration of the twisted field sensor and the associated signal indication on the receiver unit



Various sets available

You can choose from various sets that offer different combinations of CI TX-1 and LCI TX-1. Choices include two flexible clamps (AZF) and three types of mains input plugs (EU, UK, US). Each set comes with a CI RX receiver, TFS CI twisted field sensor, and a lead kit, all stored in a transport case. Additionally, options such as the inductive transmitter clamp SZ80 are also available. The ordering information can be found on the datasheet.



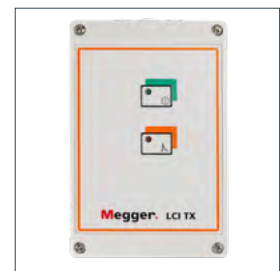
[Datasheet](#)



CI TX-1 – transmitter for de-energised cables



Complete set CI/LCI



LCI TX-1 – transmitter for energised cables (100-240 V) and phase-to-phase identification (240-440 V)



CI RX – universal receiver



TFS CI – twisted field sensor

Optional accessories



SZ-80-Set
Transmitter clamp for CI TX-1 generator



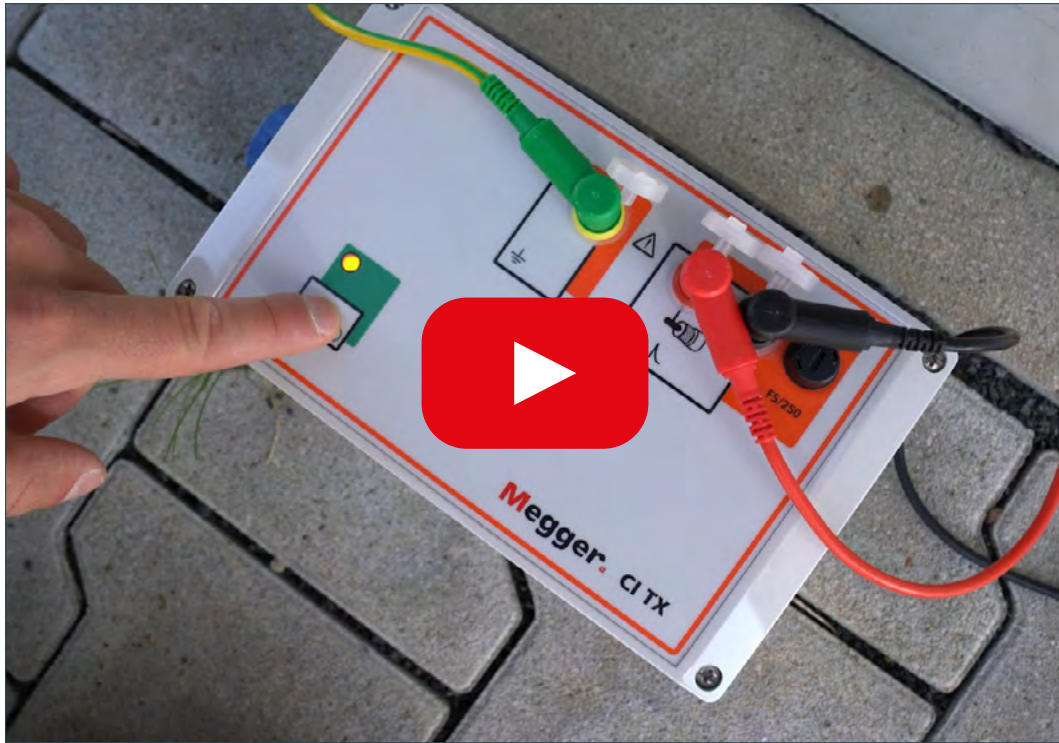
PAS CI
Phase identification sensor





MK 37 (EU, UK, US, AUS/CN)
Test lead for connection of LCI TX-1 to power outlet



MK 55
Test lead with NH-tap (00-03) for LCI TX-1



CI	LCI
<i>for medium voltage cables</i>	<i>for low voltage cables</i>
<i>de-energised cables</i>	<i>energised (live) cables</i>
	
watch CI video	watch LCI video

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[CI-LCI_BR_EN_V01.pdf](#)

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