

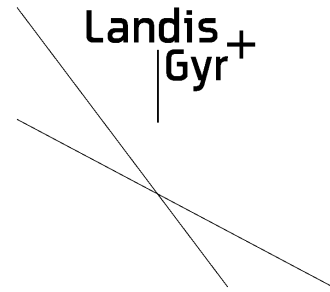
DOMESTIC

Landis+Gyr

CASHPOWER

GEMINI CSM

SPECIFICATION SHEET



The new generation Cashpower Gemini Compact Split Meter (CSM) is a single-phase, keypad-based, split prepayment electricity meter in a British Standard housing.



Energy Management Unit (EMU)

Features

- Compact meter (EMU) design, with British Standard layout
- Easy to install and ideal for new reticulation as well as retrofitting of credit meters with BS footprints
- Proven Cashpower keypad technology
- Meter provides valuable information to help consumers effectively manage and budget their electricity consumption
- Galvanically isolated communication to CIU for consumer safety

- Tamper detection
- Significant Reverse Energy (SRE) detection
- Programmable software power limit
- Advanced commissioning / decommissioning feature
- Available in 16-digit (CTS) and 20-digit (STS) encryption algorithms
- Language independent user interface
- Optional large LCD and keypad at the EMU
- Improved sealing against ingress of insects
- Easy to see diagnostic LEDs on the EMU for Meter state indication and COMMS
- High surge withstand capability for areas prone to lightning or other line surges
- SABS 1524 and IEC 62052-11, IEC 62053-21 compliant



Customer Interface Unit (CIU)

Split Meter Concept

The meter consists of two parts namely, the CIU and the EMU.

The CIU is the customer's only interface with the meter, and is a compact unit with a user-friendly keypad and display. It is usually installed in a convenient location in the consumer's home - remote from the EMU, and is connected to the EMU with a pair of communications wires.

The EMU contains all critical metering, token decryption and load control functionality. It operates independently and is immune to any form of tampering on the CIU interface.

The EMU is usually installed in a secure, locked enclosure, typically a pavement kiosk or pole-mounted equivalent. It is outside the consumer's home to facilitate easy inspection by the utility at any time and to reduce the opportunity of fraud by tampering. As an option, the EMU can be supplied with its own LCD display and keypad, which allows the utility to view important meter parameters without the need for an interrogation tool.

Principle of operation

Gemini CSM is most suitable for new reticulation. The communication wires are non-polarised, which simplifies the installation. In addition, the communication lines are galvanically isolated from the mains, thereby ensuring personal safety.

The communication wires can be included as separate cores in a concentric reticulation cable and provide a very robust communications interface between the EMU and CIU over a distance of at least 130 metres.

User-friendly customer interface

Gemini CSM is operated via the CIU in exactly the same way as other meters in the Cashpower range.

User interaction with the meter and access to meter information (such as a low credit warning, energy consumption, and load contactor status) is available using the CIU's keypad and large LCD display. The CIU makes use of clear, language-independent icons.

In addition, various audible tones are sounded under different conditions (e.g. Low Credit Alarm).

Meter status and diagnostic indicators

The EMU includes an LED status indicator. This allows a technician to view the state of the meter without the need for specialised interrogation tools or having to gain access to the consumer's premises. Information such as tamper status, power limiting, commissioned status and credit status are available.

The EMU also features a dedicated diagnostic LED for the CIU interface. It can indicate the presence of "Open" or "Short" circuited communication lines. This is a valuable visual aid that assists the technician to validate the installation and determine probable fault types.

Local HMI

As an option, the EMU can be supplied with a local Human-Machine Interface (HMI). This includes a large pictographic/numeric LCD, a keypad and an audible buzzer. This allows the utility to inspect and update various meter parameters manually.

Interrogation port

As a customer option, more detailed information and programming is achieved via the standard interrogation port at the rear of the EMU.

Optical interface

As a standard feature, the compact Gemini family offers an IEC 62056-21 compliant optical communications port. This allows the utility to access a variety of information stored inside the meter and to upload it to a hand-held unit.

Tamper detection

The split configuration of Gemini CSM meters significantly reduces the risk of tampering. The EMU is installed in a remote, secure location and is mechanically sealed against tampering through the use of a factory-sealed screw plug on the rear panel, and a utility-sealed wire seal on the front of the meter. The

use of these mechanical seals ensures that there are visible signs of tampering if unauthorised entry to the system is attempted.

In addition, the units are equipped with a tamper sensor that will automatically disconnect the power to the load in the event of tampering.

The meter also has a feature allowing detection of Significant Reverse Energy (SRE). If the line and load wires are swapped during installation, the meter will continue to operate and decrement credit but can be factory programmed to tamper and disconnect the load should SRE be detected.

Surge protection

The meter has been designed to have a surge voltage withstand that significantly exceeds the requirements of both SABS 1524 and IEC 62052-11.

Depending on the environment, the customer may want to protect the installation by providing additional surge current protection. The compact Gemini family has the option of being supplied with a built in surge arrestor

that is capable of sustaining up to 30kA during transients.

Communication line protection

The communications interface can withstand voltage surges of 6kV, however it is recommended that one of the communication lines be earthed at the EMU for additional protection. Should the customer not want to earth a communication line during installation, the meter can be fitted with protection circuitry in the terminal cover.

Product Specifications – Energy Management Unit

General Information	
Type	Single-Phase, 2-wire, direct connected prepayment meter.
Compatible network (s)	Single-Phase, 2-wire, earthed neutral ²
Operation	
General	Credit store with decrement-on-usage
Credit entry mechanism	Keypad; encrypted numeric tokens
Token encryption method	16-Digit CTS or 20-Digit STS ³
Applicable specifications	NRS009-1; NRS009-6-6; NRS009-6-7; ⁴
Electrical Ratings	
Nominal Voltage (U_n) - Rated Voltage	230 Volts AC rms (<i>other voltages available on request</i>)
Nominal frequency	50 Hz (<i>60Hz option available</i>)
Operating Voltage range	<i>80% to 120% of U_n (184V – 276V)</i>
Maximum Continuous Current (I_{max})	80 Amps (factory and field programmable to lower power limits)
Burden	
Voltage circuit	<1.8W / <10VA @ 230V
Current circuit	<2.5 VA @ Base Reference Current (I_b)
Protective class (according to IEC 62052-11)	Class II (double insulated)
Metrological Performance	
Measurement Direction	<i>Forward and reverse power detection and metering⁵ (Credit is decremented in both directions)</i>
Meter constant (LED flash rate)	1000 impulses / kWh
Basic reference current (I_b)	10A ⁶
Accurate metering range	<i>0.05 I_b to 1.2 I_{max}⁷</i>
Starting current	$\leq 0.004 I_b$
Power threshold	6.5W (approx 28mA @ 230V and $\cos(\Phi) = 1$) ⁸
Accuracy Class Index	<i>Class 1 and Class 2 meters available</i>
Maximum error	
Class 1	<i>< $\pm 1\%$ over range 0.1 I_b to I_{max}; $0.5 \leq \cos(\Phi) \leq 1.0$ (lead or lag)⁹</i>
Class 2	<i>< $\pm 2\%$ over range 0.1 I_b to I_{max}; $0.5 \leq \cos(\Phi) \leq 1.0$ (lead or lag)</i>
Disconnection device	
Type	Single Pole latching contactor. 100A.

Insulation; Overvoltage and Surge Protection	
Insulation system classification	Protective Class II (according to IEC 61036)
Insulation level	4kV rms for 1 minute
Overvoltage withstand	<i>440VAC for 48 hours¹⁰ 600VDC for 1 minute¹¹</i>

² May be compatible with other network types as well – Consult Landis+Gyr

³ STS = Standard Transfer Specification (Industry Standard); CTS = Cashpower Transfer Specification

⁴ NRS = National Rationalised Specification (South Africa)

⁵ Will accurately meter energy if Line and Load connections are reversed. Can also be configured to tamper on reverse energy detection.

⁶ Other Base Currents available on request.

⁷ The metering is accurate within the limits specified by IEC62053-21. Should a meter momentarily be operated outside its specified maximum current rating it will meter accurately up to 1.2 I_{max} .

⁸ The Power Threshold represents the minimum load power that the meter will register. This value is programmable, with the recommended level for a base 10A meter shown.

⁹ IEC 62053-21: $0.8 \leq \cos(\Phi) \leq 1.0$ Leading, $0.5 \leq \cos(\Phi) \leq 1.0$ Lagging

¹⁰ This higher specification (440V as opposed to 400V) has not yet formed part of the official specification

¹¹ This higher end test is not a requirement of IEC 62052

Surge immunity Voltage impulse withstand Differential Current impulse withstand Service rating Withstand rating Specification compliance	In excess of 6kV, 1.2/50µs, with 2Ω source impedance (according to SABS 1524-1) 5 kA 8/20µs (with optional surge arrester populated) 30 kA, 4/10µs (with optional surge arrester populated) SABS 1524-1, IEC 62052-11
Electromagnetic compatibility (EMC) Electrostatic discharge Immunity to HF fields Immunity to fast transient bursts Radio interference Specification compliance	15 kV air discharge 80 MHz to 2 GHz @ 10V/m with load, 80MHz to 2GHz @ 30V/m no load 4 kV Complies with requirements for CISPR 22 IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-6 CISPR 22
Communication Circuitry	
Type Rated Impulse Voltage Insulation Properties Communication Distance	Galvanically Isolated, Non-Polarised, 2-wire, half-duplex. Meter is independent of CIU function Peak Voltage 6kV (1,2/50µs) waveform (according to IEC 62052-11 Protective Class II) 4kVrms (1 minute) (according to IEC 62052-11 Protective Class II) Up to 130 metres, with a maximum total loop resistance of 40Ω

Main Enclosure	
Type	Layout according to BS5685 footprint
Mounting	Two mounting screws bottom (spacing according to BS5685). Top mounting bracket available as an option
Rating	IP54 (IEC60529) ¹²
Material Resistance to heat and fire Resistance to spread of fire	UV Stable Polycarbonate/ABS blend with flame-retardant <i>Complies with 960°C¹³ glow-wire (IEC 60695-2-1)</i> <i>UL94-V0 rated @1.5mm. No toxic gases emitted: 'Green Material'¹⁴</i>
Dimensions	142mm(H) x 122mm(W) x 69mm(D) with short terminal cover ¹⁵
Mass	510 g
Terminals	
Layout	According to BS5685
Mains Terminals Type Material Maximum Cable Size	Double screw (M6), moving-cage terminal Mild steel, yellow passivated 25mm ²
Terminal Block Material Resistance to heat and fire Resistance to spread of fire	UV Stable Polycarbonate with flame-retardant <i>Complies with 960°C¹⁶ glow-wire (IEC 60695-2-1)</i> <i>UL94-V0 rated @1.5mm. No toxic gases emitted: 'Green Material'¹⁷</i>
Customer Interface Unit Terminals Type Maximum cable size	Single screw cage terminal (moving screw) 2.5mm ²

¹² Only IP51 rating is required by IEC 62052-11 for indoor meters

¹³ Only 650°C called for by standard industry specification

¹⁴ No V-rating or 'Green' material called for by industry specifications

¹⁵ See diagram

¹⁶ Only 650°C called for by standard industry specification

¹⁷ No V-rating or 'Green' material called for by industry specifications

Sealing	
Type	
Meter enclosure	Factory sealed with screw-sealing plugs
Terminal cover	Utility sealed with wire and crimped ferrule
Operating Environment	
Area of application	Indoor meter (according to IEC62052-11)
Operating temperature range	-10°C (+14°F) to +55°C (+131°F)
Storage temperature range	-25°C (-13°F) to +70°C (+158°F)
Relative humidity	Maximum ≤95%; Annual mean 75%
Man-Machine Interface (Basic Option)	
Rate of consumption indicator	Visible LED, 1000 pulses/kWh
Status Indication	Visible LED
CIU Operating Indication	Visible LED
Man-Machine Interface (Full HMI Option)	
Rate of consumption indicator	Visible LED, 1000 pulses/kWh
Liquid Crystal Display (LCD)	
Size	9cm ² (45mm (W) x 20mm (H)), 8 digits + 11 icons
Icon information	Happy face, Sad face, Alert, Breaker status, Info, kWh, 4-segment credit wedge
Numeric information	Display of various meter information such as credit levels, token entry, etc. Additional meter parameters are accessible via the "Information" key
Keypad	12-key, international standard layout including "Information" and "Backspace" keys
Buzzer	Audio feedback on key-press.
External interfaces	
Standard Interrogation Port	8-pin interface according to ESKOM SCSSCAA9 ¹⁸
Optical Communications Port	According to IEC 62056-21
Proprietary Interrogation Port	Data interface for Cashpower Powermate II TM or Powerscope II®
Specification compliance and Approvals	
IEC	IEC 62052-11; IEC 62053-21 IEC 62056-21 First Edition: 2002
SABS	SABS 1524-1 Edition 3
ESKOM	
Prepayment meters	ESKOM SCSSCAA9 Rev0: 1997 +Amendment 1: 2000 (formerly MC171)
BS	BS 5685: 1979

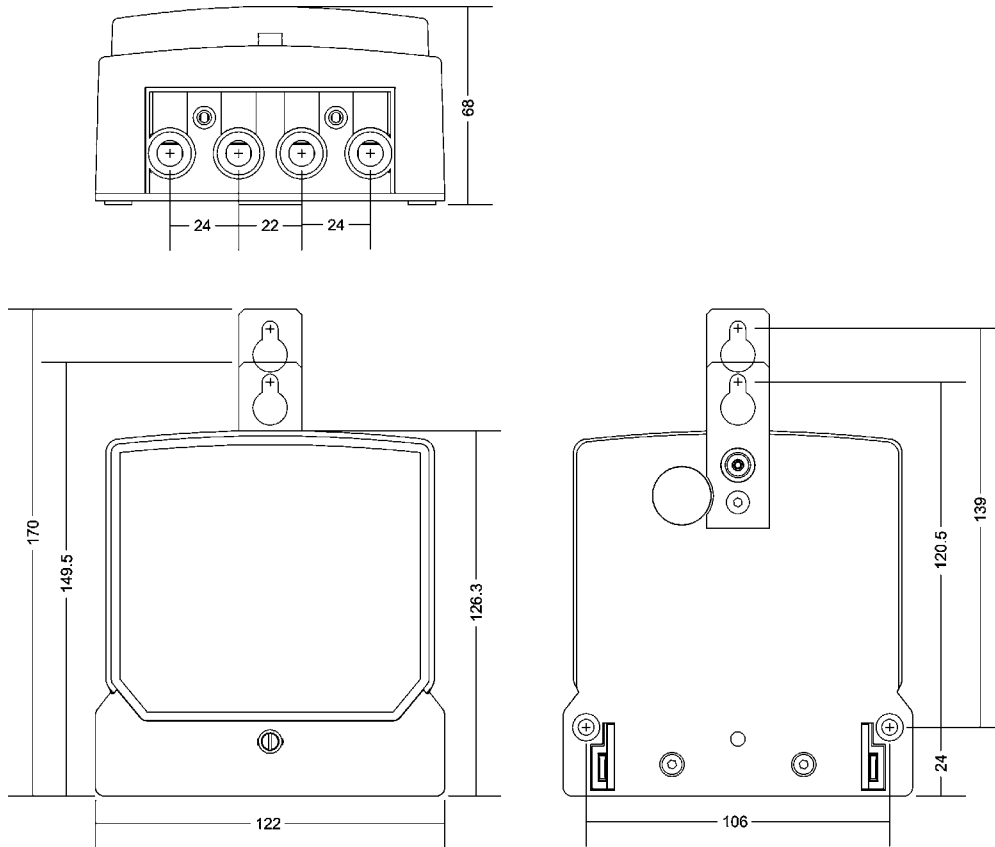
¹⁸ Available on request

PRODUCT SPECIFICATIONS – CUSTOMER INTERFACE UNIT

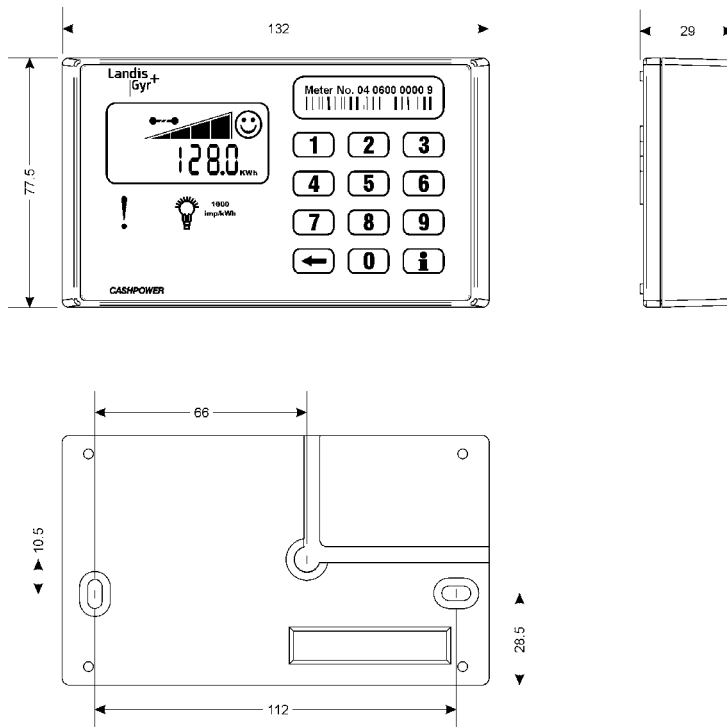
Electrical	
Type	Isolated, non-polarised, 2-wire, half-duplex, 12Vdc from meter
Operating Range (Communication)	Up to 130 metres, with a maximum total loop resistance of 40Ω
Operating Environment	
Operating Temperature Range	-10°C (+14°F) to +55°C (+131°F)
Storage Temperature Range	-25°C (+12°F) to +70°C (+158°F)
Relative Humidity (IEC 6 1036)	Maximum ≤95%; Annual mean 75%
Enclosure	
Type	Slimline, wall mounted
Rating	IP 51
Material	ABS
Dimensions	69mm(H) x 134mm(W) x 25mm(D)
Weight	100 g
Terminals	
Type	2-way screw terminal
Maximum cable size	2.5mm ²
Sealing	
Enclosure	Factory Sealed, no user serviceable parts

Man-Machine Interface	
Type	Language-independent
Components	Pictographic/Numeric LCD display, keypad, LED rate of consumption indicator, audio feedback
Liquid Crystal Display (LCD)	
Size	9cm ² (45mm (W) x 20mm (H)), 8 digits + 11 icons
Icon information	Happy face, Sad face, Alert, Breaker status, Info, kWh, 4-segment credit wedge
Numeric information	Display of various meter information such as credit levels, token entry, etc
Keypad	12-key, international standard layout including "Information" and "Backspace" keys
Buzzer	Audio feedback on keypress, Token Accept and Reject melodies, Low-credit alarms as a factory-programmable option
Light Emitting Diode (LED)	Rate of consumption indicator (Pulse rate proportional to current rate of consumption)
Diagnostic information	30 additional meter parameters accessible via the "Information" key

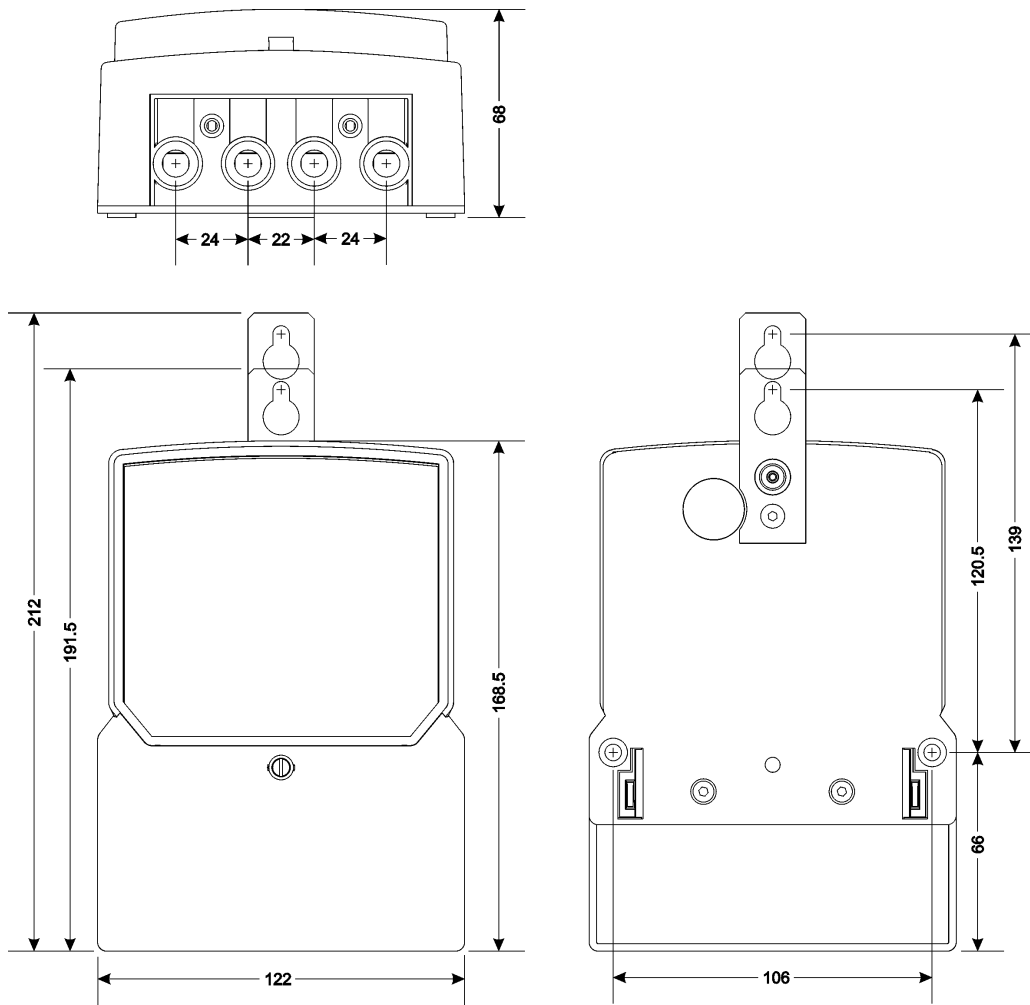
PRODUCT SPECIFICATIONS – Dimensions



Meter dimensions - short terminal cover



CIU dimensions



Meter dimensions - long terminal cover

Landis+Gyr (Pty) Ltd.
 PO Box 281, Isando, 1600
 60 Electron Avenue, Isando, Gauteng
 South Africa
 phone: +27 11 921 7900
 fax: +27 11 921 7977
 e-mail: info@cashpower.co.za
www.cashpower.com