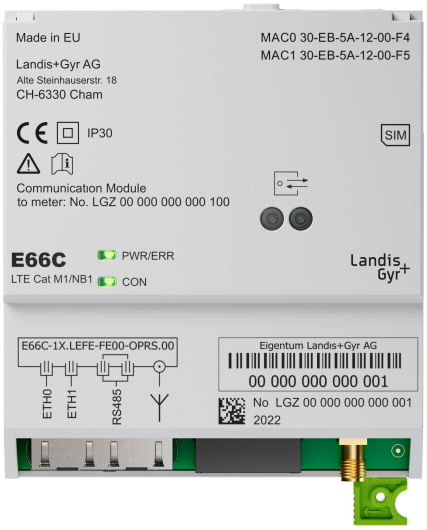
Communication

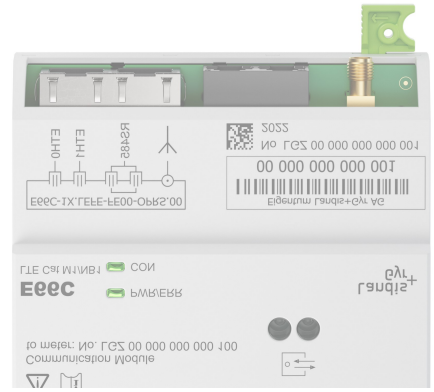
Industrial, commercial and grid

Communication module

E66C

Technical data





E66C communication modules provide LTE Cat M1/(NB1), LTE Cat 1/(GPRS), RS-485 and Ethernet communication between the E660 device family and metering systems.

Date: 23.10.2023
D000065496 g en 1.14

Revision history

Version	Date	Comments
a	03.08.2020	First edition.
b	13.08.2020	Added maximum transmit power. Updated typical application diagram.
c	29.10.2020	Updated RS-485 characteristics.
d	31.01.2022	Updated product name and weight.
e	01.11.2022	Series 2. Added Cat 1 variant.
f	19.06.2023	Added new variant with three RS-485 interfaces.
g	23.10.2023	Corrected typo.

E66C communication module – Technical data

General

Design

Product type options

Type	LTE Cat 1/ GPRS	LTE Cat M1/NB1	10/100 BASE-TX	RS-485
E66C Cat M1		●	●●	●
E66C ETH			●●	●
E66C Cat 1	●		●●	●
E66C ETH with 3x RS-485			●●	●●●

Supported service protocols

- Maintenance interface:
  - Based on RESTful web service
  - Over the browser-based web interface
- Forwarding and bridging is protocol independent, verification recommended

Installation

Directly in meter (E660)

Features

- EMC conformance for the combination of meter and modem for electrical metering equipment
- Multiple independent channels for meter access
- Configuration of E660 using the optical head with .MAP110 Service Tool
- Configuration using e.g. a browser-based web interface or any third-party tool supporting the RESTful web service
- Remotely updatable firmware in the main application and the LTE Cat 1 and M1 modems

Configurable forwarding (virtual bus)

Interfaces:

- USB-based proprietary base meter interface
- DLMS/COSEM is the service protocol to the base meter
- TCP IP connection (Ethernet/LTE modem)
- Serial RS-485 connection

Processor and hardware description

Application processor	ARM Cortex-A5
Clock speed	600 MHz
Core performance	828 DMIPS
DRAM capacity	256 Mbytes
FLASH capacity	8 Gbytes
Encryption co-processor	AES, 3DES
Overvoltage category with E660	III[1]
Protection class	IP30[2]

Power consumption

Maximum active/apparent power

4.0 W/7.3 VA

LTE Cat 1 and M1 modems (E66C Cat 1 and M1/NB1)

Operating modes

Technology	LTE Cat 1, LTE Cat M1/NB1 or GPRS
SIM card 1.8/3 V	field exchangeable
Size	mini-SIM (2FF)

Frequency bands	Cat M1/NB1	Cat 1 (4G)	GPRS
B1 (2100 MHz)		●	
B3 (1800 MHz)	●	●	●
B7 (2600 MHz)		●	
B8 (800 MHz)	●	●	●
B20 (800 MHz DD)	●	●	
B28 (700 MHz APT)		●	

Standards and approvals

Cat 1, Cat M1/NB1:

Complies with the essential requirements of the Radio Equipment Directive 2014/53/EC.

Effective use of spectrum RED Article 3.2

- ETSI EN 301 908-1 v11.1.1

EMC RED Article 3.1b

- ETSI EN 301 908-1 v2.2.1
- ETSI EN 301 489-52 v1.1.1

Safety RED Article 3.1a

- EN 62368-1:2021

[1] In certain E660/E66C module variant combinations OVC IV categorisation is possible. Consult Product Management.
[2] When installed in its intended location inside an E660 the IP rating of the meter applies (IP54).

ETH:

Safety

- EN 62368-1:2021

ETH with 3x RS-485:

Safety

- EN 62052-31

Functions

- Standardised communication interfaces
  - Supporting meter push capability
- Standardised and secure application layer interfaces and secure data storage
- Multi-stakeholder/multi-user concurrent access to base meter and other applications
- Legacy meter-room support over RS-485
- Ethernet meter-room with no degradation of functionality of LAN connected meters
- Communication media transformation (with port-forwarding)
  - Serial, TCP/IP and UDP/IP
- Communication protocol transformation (with applicable licenses) including:
  - IEC 62056 DLMS-COSEM (Client)
  - IEC 61158 Modbus (Client/Server)
  - IEC 60870-5-104 SCADA (Server)
  - IEC 61850 (Server)
- Grid Edge applications (with applicable licenses)
- Secure application and communication modem remote firmware upgrade

LTE modem

Maximum transmit power (conducted)

Class 3 (23±2 dBm) for LTE-FDD

Class E2 (26±3 dBm) for DCS1800 8-PSK

Class E2 (27±3 dBm) for EGSM900 8-PSK

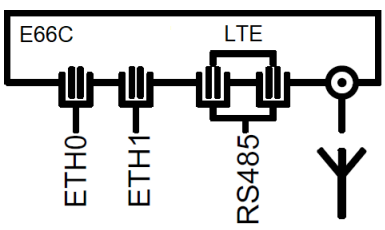
Class 1 (30±2 dBm) for DCS1800

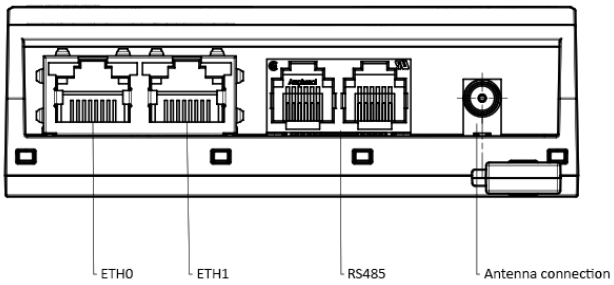
Class 4 (33±2 dBm) for EGSM900

Terminals

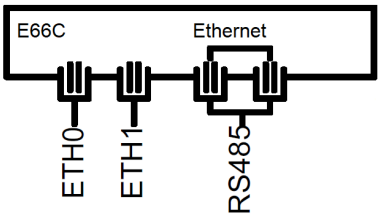
Terminal layout

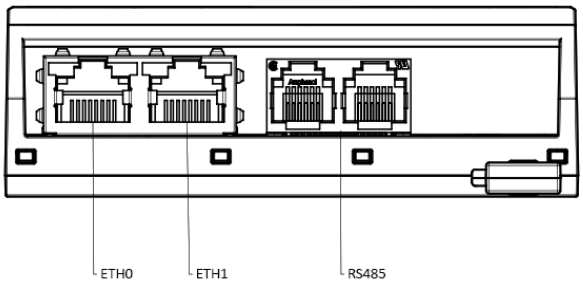
E66C Cat 1/GPRS, Cat M1/NB1



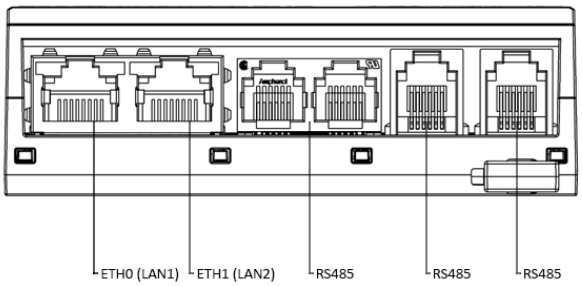


E66C ETH





E66C ETH with 3x RS-485

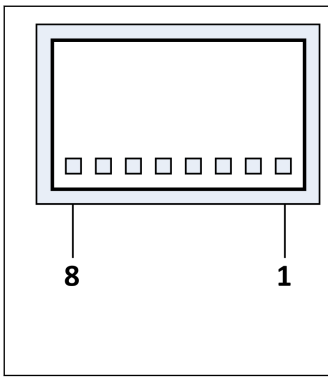


Ethernet interfaces

SELV, reinforced insulation, OVC III

Type RJ-45 socket

Pin assignment



1	TxD+
2	TxD-
3	RxD+
4	Not used
5	Not used
6	RxD-
7	Not used
8	Not used

All Ethernet interfaces	
Technology	10/100-BASE-TX
Duplex	half or full
MDI/MDIX	auto
Maximum cable length	up to 100 m

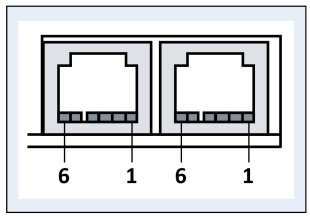
Configurable Ethernet interfaces
ETH0 and ETH1 are independently configurable

Network bridging	
Number of devices in bridging mode	tested up to 20

RS-485 interface

SELV, reinforced insulation, OVC III	
Type	twin jack RJ-12 and 2x RJ-12

Pin assignment



1	C (common ground)
2	Data A
3	Data B
4	Data B
5	Data A
6	C (common ground)

Characteristics	
Symmetrical, serial, asynchronous, half-duplex interface (master or slave depending on parameterisation)	
Maximum number of slaves	31
Standard format	8N1
Maximum transmission rate	1 Mbaud
Maximum line length	
- Up to 250 m at max. 57.6 kbps, max. 31 slaves	
- Up to 550 m at max. 38.4 kbps, max. 31 slaves	
- Up to 1000 m at max. 19.2 kbps, max. 15 slaves	

Antenna connection (E66C Cat 1/GPRS, Cat M1/NB1)

SELV, reinforced insulation, OVC III	
Type	female SMA socket
Tear-off strength	< 100 N

Optical interface

Optical interface	
Service access to the E660 base meter	
Electrical-physical properties according to IEC 62056-21	
Type	serial, asynchronous, half-duplex
Max. transmission rate	38,400 bps
Protocols	DLMS/COSEM

LED indicators

LED CON	
Indication of data traffic	green and red

LED PWR/ERR	
Indication of operating status	green and red

Configuration switches

Dip switches	
Position 1	bus termination enable
Position 2	bus bias enable
Position 3	bus bias enable
Position 4	not used

Environmental influences

Temperature range	according to IEC 62052-11
Operation E66C ETH and ETH 3x RS-485	-40 °C to +70 °C
Operation E66C Cat 1, Cat M1/NB1	-40 °C to +60 °C
Storage E66C (all variants)	-40 °C to +85 °C

Insulation strength to meter

Insulation strength
4 kV at 50 Hz for 1 min

Product safety

According to IEC 60721-3-3 and IEC 61010-1	
Extended environmental conditions	3K6
Pollution degree	2

Material

Housing material
Polycarbonate, partly glass-fibre reinforced

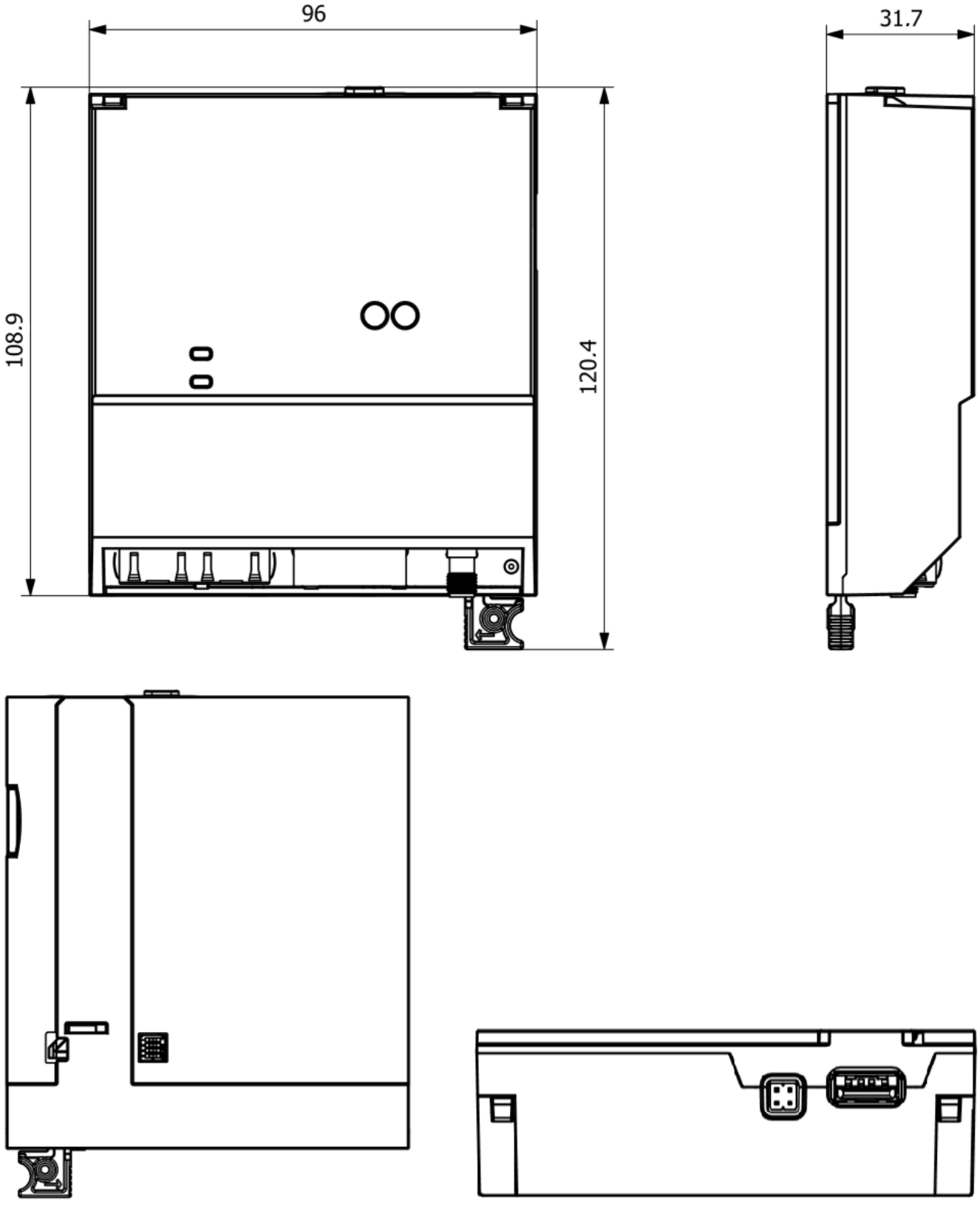
Housing material
Flame resistant
Interlock: Polyoxymethylene (POM)

Weight and dimensions

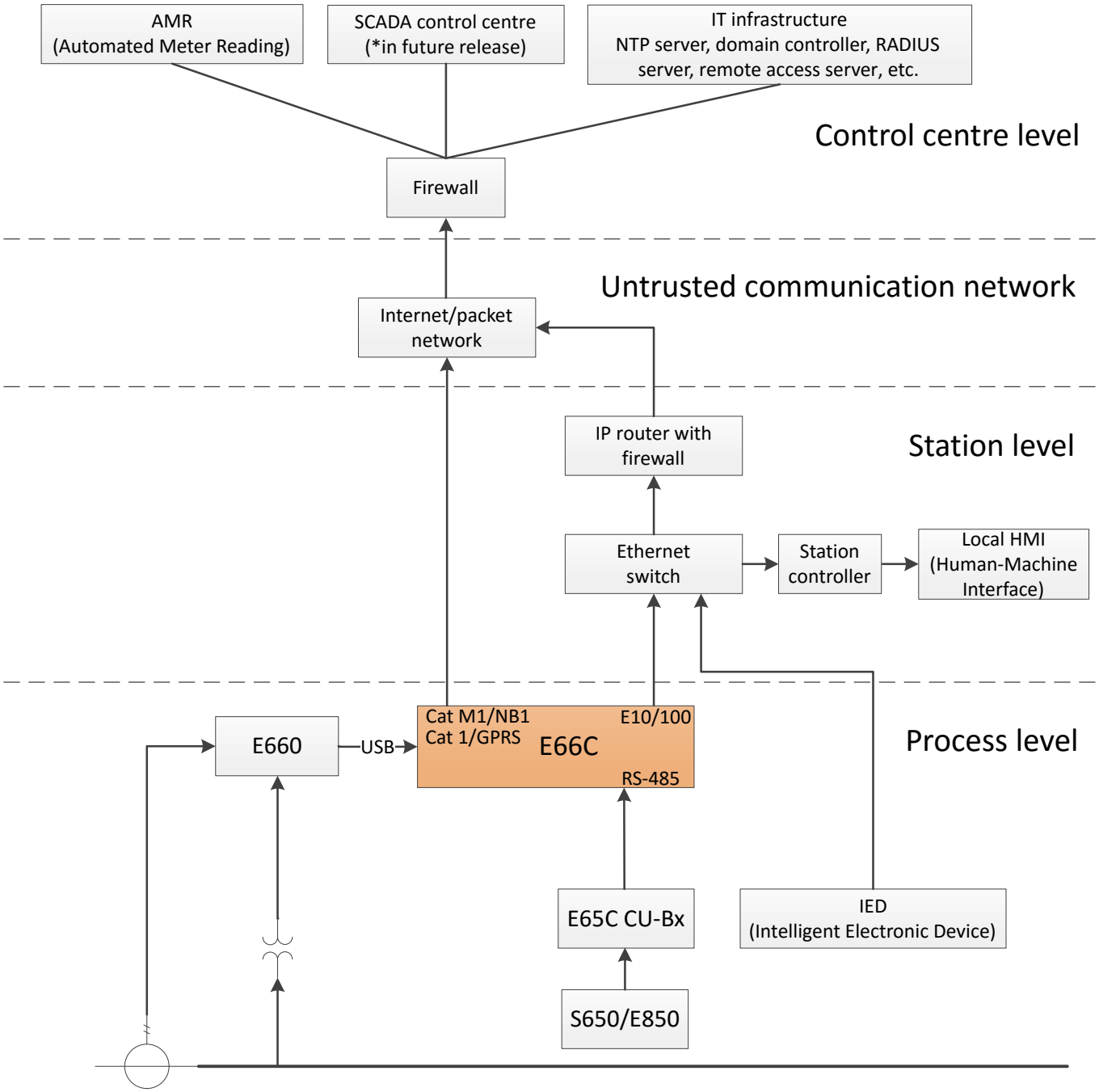
Weight	
	180 g

Dimensions	
Width	96 mm
Height	120.4 mm
Depth	31.7 mm

Dimensions (front/right side/back/top)



Typical application diagram



Type designation

Example	E66C -	1X -	LEFE -	FE00 -	OPRS -	00

Brand name and segment

E66C Communication module

Product generation

1X First generation
2X Second generation

Primary interface type WAN

00 None
LE LTE Cat M1 for listed bands
LF LTE Cat 1 with GPRS
FE Fast Ethernet

Secondary interface type LAN

FE Fast Ethernet
00

Other interface

OP Optical interface
RS RS-485
RM >1 RS-485

Reserved

00

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