

**ON-TRAIN METER READING SYSTEM MARSYST-D FOR DC POWER APPLICATIONS IS BASED ON:**

**KWH-MARSEN**

Accuracy class with respect to energy measurements 0.5 or 1.0.  
 National Registry N 58638-14

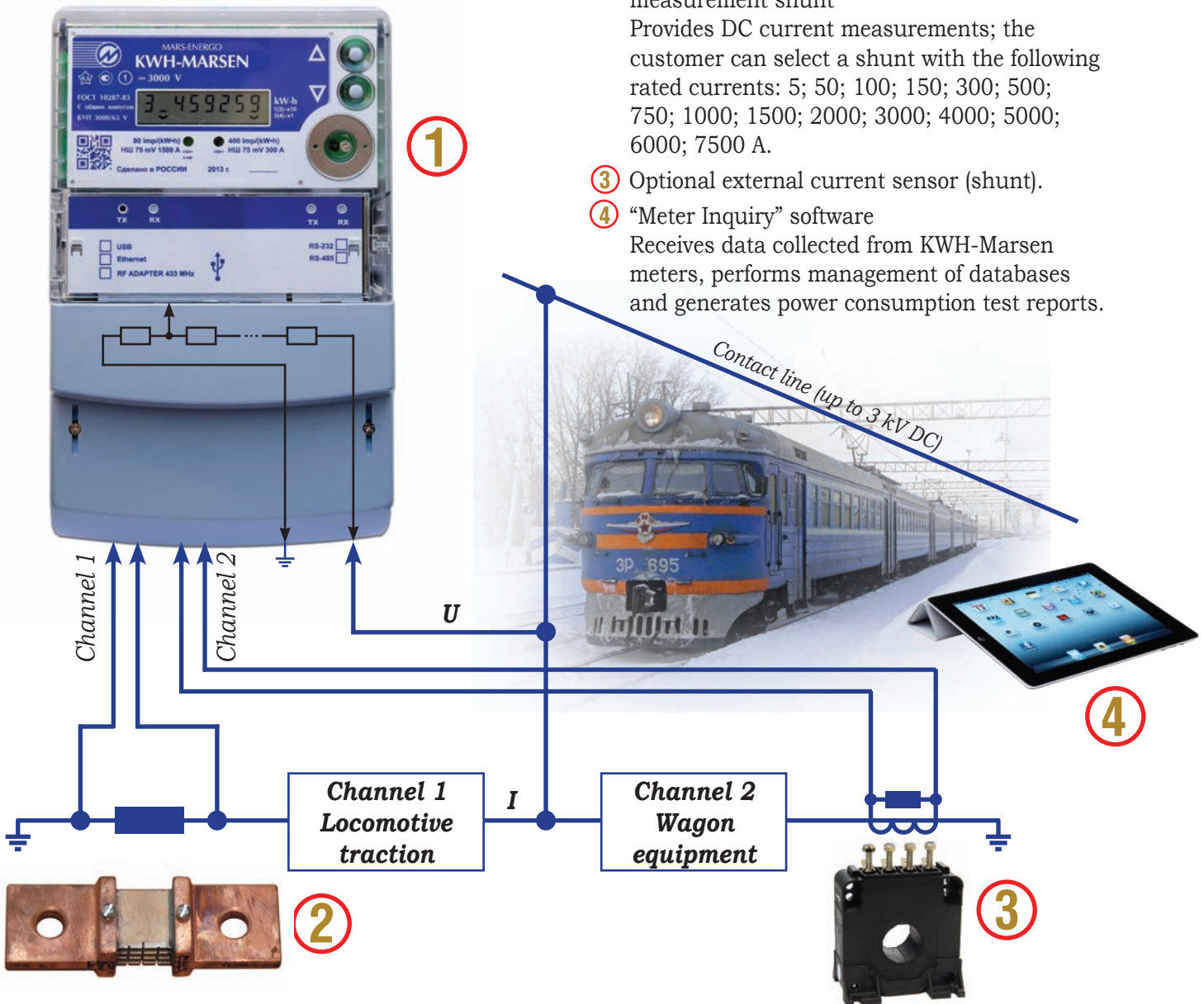
**DC ENERGY METER**

**Sphere of application:**

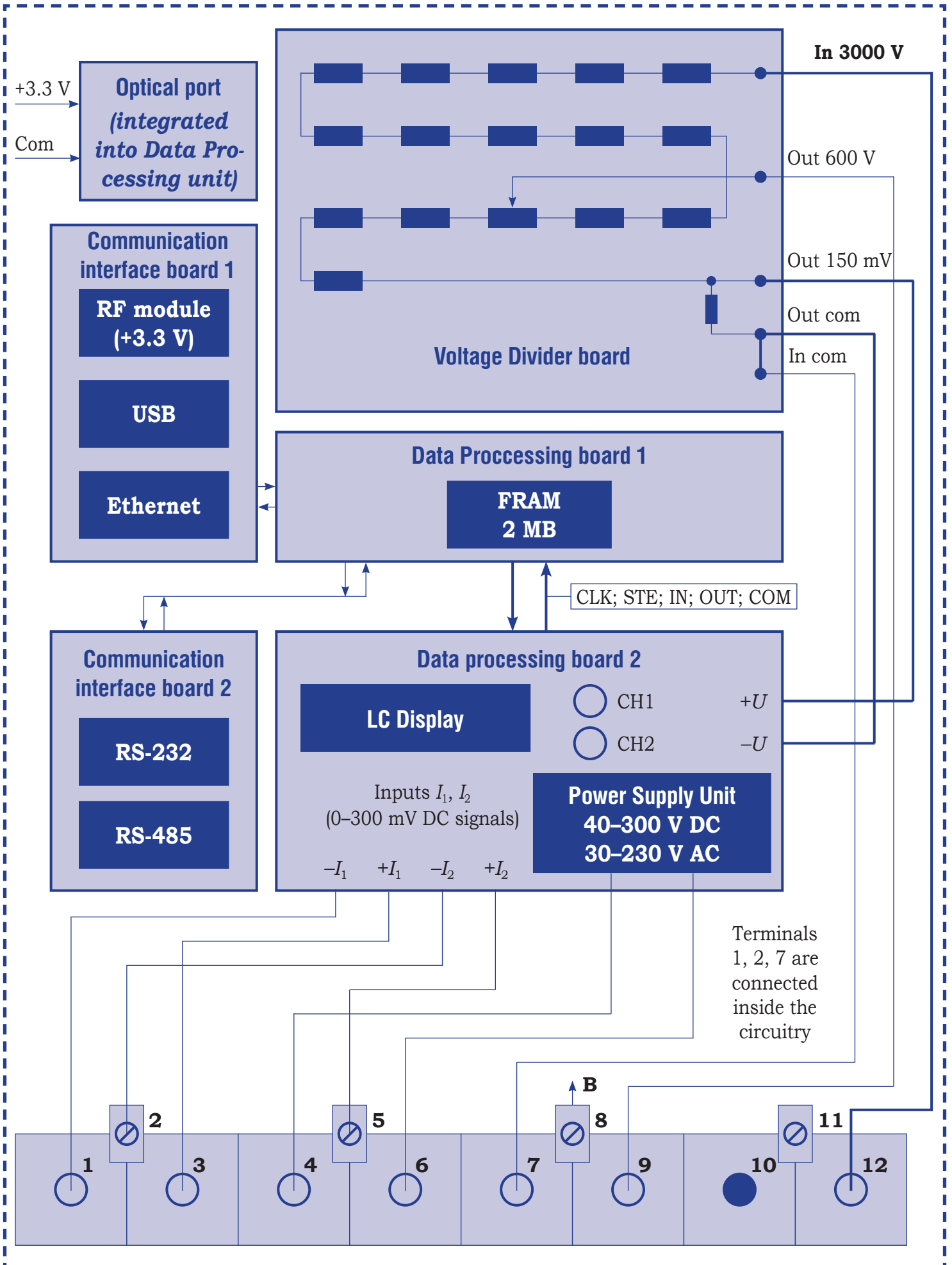
DC energy metering in on-train railway systems: designed for use in on-board traction and other transport DC power systems.

**Components of the system:**

- ① Meter KWH-Marsen  
 Depending on the internal voltage divider, the meter provides DC voltage measurements at rated voltages 100; 400; 600; 800; 1500; 3000 V.
- ② External high-precision current measurement shunt  
 Provides DC current measurements; the customer can select a shunt with the following rated currents: 5; 50; 100; 150; 300; 500; 750; 1000; 1500; 2000; 3000; 4000; 5000; 6000; 7500 A.
- ③ Optional external current sensor (shunt).
- ④ "Meter Inquiry" software  
 Receives data collected from KWH-Marsen meters, performs management of databases and generates power consumption test reports.

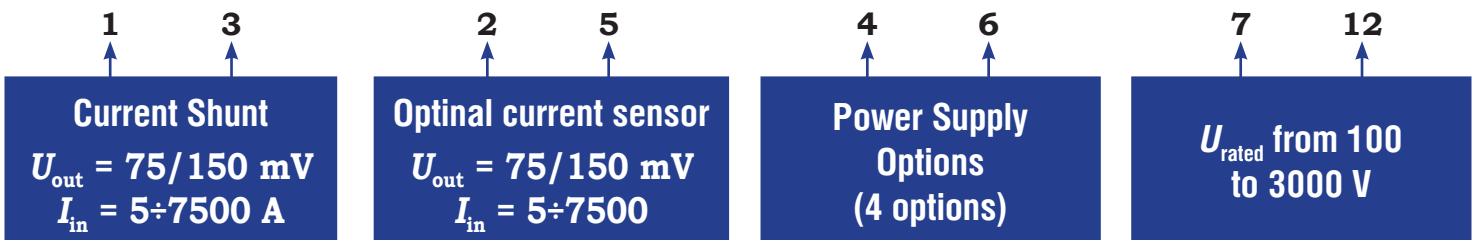
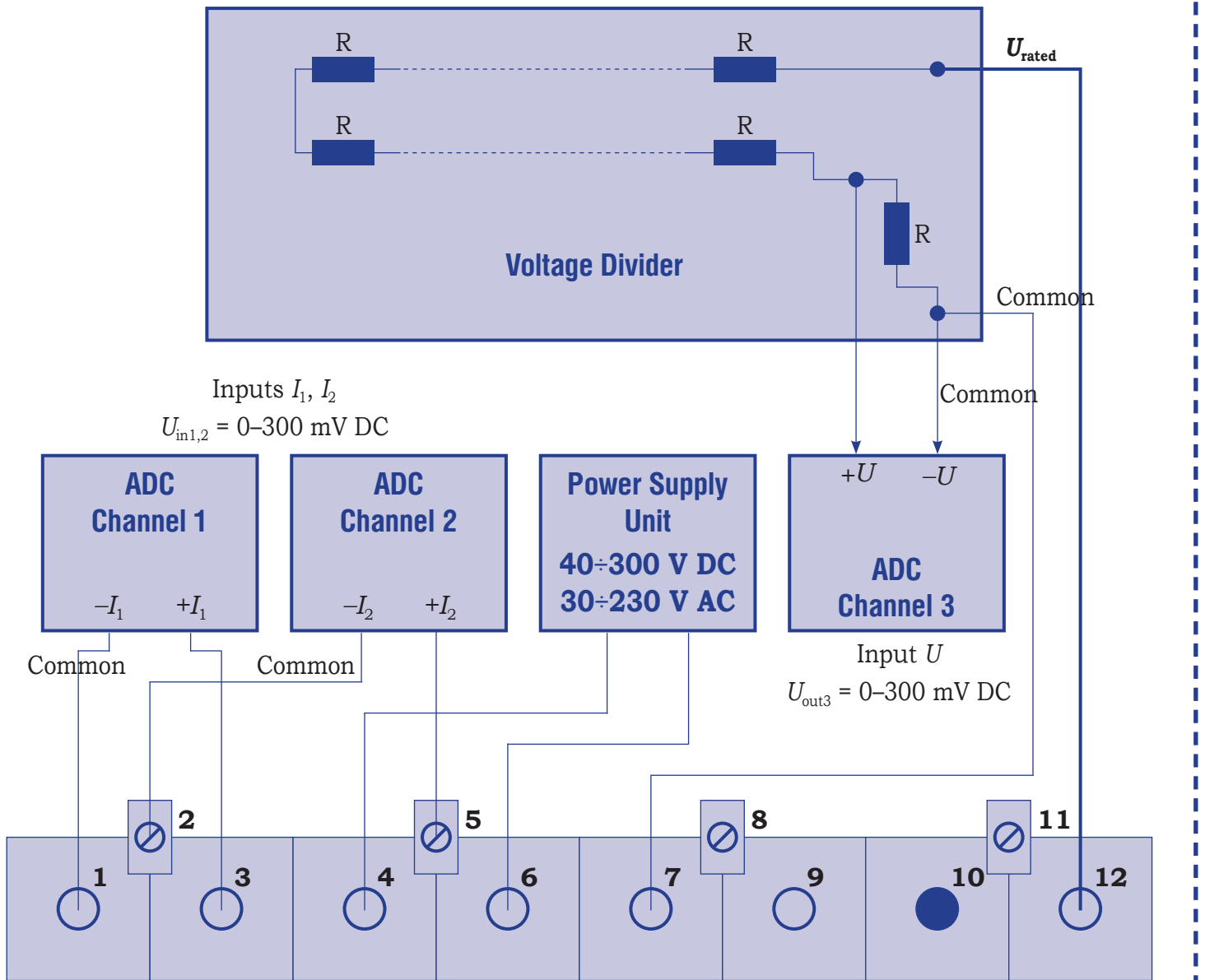


# Block diagram of KWH-Marsen DC energy meter (rated at 3 kV)



# Connecting external current sensors (shunts) and power supply sources to KWH-Marsen

## Measurement channels



**Ballast Power Supply unit (2 design options available) provides power from measured circuit**

**BUP1:**  
 1) at  $U_{in BUP} = U_{meter, rated} = 400 \div 800 \text{ V DC}$

**BUP2:**  
 2) at  $U_{in BUP} = U_{meter, rated} = 1500, 3000 \text{ V DC}$

$U_{out BUP} = U_{supply} = 50 \div 250 \text{ V DC}$

**HV Galvanic Isolation Module (PP1) provides power from an auxiliary network**

3) if  $U_{meter, rated} = 1500; 3000 \text{ V DC}$ :  
 $U_{in PP1} = U_{network} = 50 \div 150 \text{ V DC}$

$U_{out PP} = U_{supply} = 50 \div 100 \text{ V DC}$

**KWH-Marsen is powered directly from measured circuit**

4) if  $U_{meter, rated} = \text{less than } 800 \text{ V}$ :  
 $U_{circuit} = 50 \div 250 \text{ V DC/AC}$

# Scope of supply and accessories



RF adapter  
433 MHz



Display panel



"Meter Inquiry"  
software

Records basic electric energy parameters (current, power, energy, contact line voltage etc.) in the form of profiles with averaging interval selectable from 1 s to 30 min.

When all input and output parameters are recorded, logging capacity is: at least 1 day (at 1 s averaging interval) at least 3 years (at 30 min averaging interval)

## Wired and wireless interfaces



USB  
Ethernet  
RF module  
433 MHz



RS 232  
RS 485



GSM-modem

## Power supply options



Power Supply  
Units of 2 types  
(BUP1 and BUP2)



HV Halvanic  
Isolation  
Module (PP1)



2-channel KWH-Marsen with  
internal Voltage Divider 3 kV

Overall dimensions  
(height × width × depth):  
277 × 170 × 83 mm, or less  
Weight: 1.5 kg, or less.

## Metering Channel 1 (main): energy consumption and regeneration



External current shunt

## Metering Channel 2 (optional): energy consumption and regeneration



Current sensor with power supply unit BP-1



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