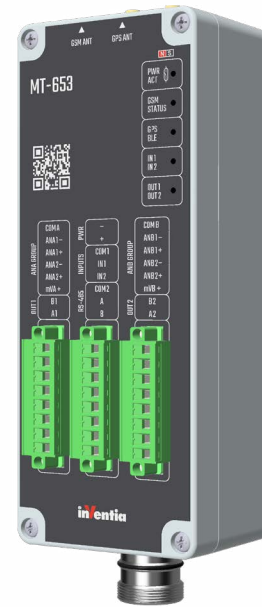


- Embedded 2G/3G/4G modem
- Integral GPS receiver supporting: GPS, QZSS, Glonass, Galileo, BeiDou
- 6 measurement channels
- Measurement of AC and DC voltages
- Measurement in the range of microvolts
- 2 binary inputs
- 2 relay outputs
- Dual-SIM technology (passive) - access to 2 independent GSM networks ensures superior availability
- Remote communication via network and SMS commands
- BLE interface for configuration, measurement triggering and reading of measurements in the application
- Local configuration of the module via USB-C port
- RS-485 serial port for external devices, Modbus RTU Slave operating mode
- Reed switch for triggering measurements
- External power supply back-up: 10.8 V/5.8 Ah lithium battery pack or Li-Ion battery pack 3.6 V/2.6 Ah
- 5 diagnostic LEDs
- Internal GPS antenna, detachable when external SMA antenna is connected
- Two sets of connectors: M23 and detachable terminal blocks
- Ready for NIS2



- Real-time clock (RTC) synchronised with the time transmitted in the GNSS system signal
- Data logger with 0.1s resolution and 180k record capacity
- Remote configuration, diagnostics and firmware update firmware (OTA)
- 3-year warranty

The MT-653 is a new telemetry module, designed for the effective monitoring and management of cathodic protection installations of pipelines, tanks and other metallic underground or submerged structures. The device features an integral 2G/3G/4G modem and a unique GPS receiver that supports various navigation systems to ensure reliable communication and precise time synchronisation.

With six measurement channels, the MT-653 can measure DC and AC voltages in the typical measurement ranges for cathodic protection. A set of two types of connectors allows installation in both measuring cabinets and narrow measuring poles. Two binary inputs and two relay outputs provide flexibility in applications. Dual-SIM technology offers redundancy in data transmission, and the number of communication options – including a standard USB-C port, an RS-485 serial port in Modbus RTU Slave mode and a BLE interface – allows easy configuration and remote access.

The MT-653 not only adapts to the needs of the installation, but also guarantees security, thanks to built-in data protection mechanisms. A powerful data logger, capable of collecting records at high frequency, and diagnostic functions make it an ideal choice for complex monitoring systems. In addition, the long operating time on internal power, backed up by a set of lithium batteries or a lithium-ion battery (depending on the version ordered) proves its energy efficiency and the 3-year guarantee ensures that the module will work.

### Functionality:

- Mounting in measuring post Ø100 mm or on DIN rail 35 mm
- External 9-30V DC power supply (with automatic detection of 24V power supply or 12V battery) with back-up option: internal lithium battery or lithium-ion battery (depending on order)
- USB-C communication interfaces, RS-485 (isolated)
- Integral modem:
  - » 2G (850, 900, 1800, 1900 MHz)
  - » 3G (bands: 1, 2, 5, 8)
  - » 4G (bands: 1, 2, 3, 4, 5, 6, 7, 8, 12, 13, 18, 19, 20, 26, 28, 38, 39, 40, 41)

- Dual-SIM – possibility of using two SIM cards
- 2 galvanically isolated analogue input groups containing 2 differential inputs (configurable ranges 0-10 V or 0-100 V), and one dedicated 0-100 mV input in each group, i.e. a maximum of 6 measurement channels
- 2 relay outputs (one NC, the other adapted to control an external high-power bistable relay)
- 2 binary inputs (IN1 isolated, voltage; IN2 short-circuit to supply earth, internal pull-up to 3.3 V)
- Two sets of connectors: M23 on the bottom panel and 3 pieces of 8pin on the front panel
- Synchronised measurement execution
- User-configurable measurement and task schedules (independent for each power source)
- Built-in GNSS receiver for time synchronisation
- Accelerometer to detect manipulation of the device or devastation of an object with movement of the device
- Remote configuration and reading of measurement data and device status
- External voltage loss detection and monitoring of power source voltage status
- Internal device temperature measurement
- Diagnostic LEDs (power and module activity status, modem status, GPS status, I/O status)
- Recorder with 0.1 s sampling step recording measurements in internal FLASH memory
- Remote configuration, updating and diagnostics of the device via network
- Possibility of integration with any SCADA system
- Communication methods:
  - » Data packet transmission
  - » SMS messages



2DI - 2DO

6AI



DIN RAIL



RS-485  
MODBUS.RTU

4G



ready

- Configurable via USB-C port
- Access to internal registers of the device via RS-485, Modbus RTU
- Protection against unauthorised access in the form of a list of authorised phone and IP numbers, optional password
- User-friendly configuration tools and clear communication interface
- Open 2 communication protocol

**General**

Dimensions (HxWxD)	190 x 75 x 55 mm
Weight	900 g
Operating temperature	-20... +55 °C
Protection class	IP65

**Modem**

Modem type	LARA-R6001D
Region	Global
2G bands	850, 900, 1800, 1900 MHz
3G bands	Band 1, 2, 5, 8
4G bands	Band 1, 2, 3, 4, 5, 6, 7, 8, 12, 13, 18, 19, 20, 26, 28, 38, 39, 40, 41
GSM antenna connector	50 Ω, SMA-F

**PWR power supply**

Voltage range (DC)	9 – 30 V
Internal battery backup	Lithium battery pack 3 x LSH14 (3.6V), 10.8V, 5.8Ah capacity Lithium-ion battery pack Li-Ion 3.6V, 2.6Ah
Input current (for 24 V):	
Idle	200 μA
Active	47 mA (200 mA charging)
Max	600 mA

**Binary inputs IN1**

Input voltage range	0 ... +30 V
Input resistance	8,1 kΩ typ.
Input voltage ON (1)	> 9 V min
Input voltage OFF (0)	< 3 V max.
Minimum pulse length	5 ms

**Binary inputs IN2**

Polarity of the NO contact	3,3 V
Input resistance	440 kΩ typ.
Input voltage ON (1)	< 0,9 V min
Input voltage OFF (0)	> 2,2 V max.
Minimum pulse length	5 ms

**Binary outputs OUT1, OUT2**

Voltage switching AC/DC	220 V
Maximum current for single output	1,5 A
Maximum switchable power	50 W, 100 VA

**Datalogger**

Capacity (internal memory)	180 000 records
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**Internal temperature sensor**

Accuracy	±1 °C
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**Two group of optoisolated input with common ground (ANA, ANB)**

0-100 mV input: mVA, mVB	
Measurement range	±100 mV
Measurement resolution	1 μV
Accuracy DC	±0,1 %
Input resistance for 0-100 mV input	>1 MΩ
0-100 V input: ANA1, ANA2, ANB1, ANB2	
Measurement range DC	±10 V; ±100 V
Measurement range AC	100 V
Accuracy DC	±0,1 %
Input resistance for 0-100 V	>10 MΩ

It is recommended to use external surge arresters in accordance with in accordance with current regulations, standards and good engineering practice, depending on the conditions of the installation in which they will be used.

**GPS receiver**

Accuracy of time synchronisation	±1 ms
Supported standards	GPS, QZSS/SBAS, GLONASS, Galileo, BeiDou
Connector for external GPS antenna	SMA-F

**Communication interfaces RS-485, USB, BLE**

Wired	RS-485 (optoisolated) USB (non isolated, after opening the housing)
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**Drawings and dimensions (all dimensions in millimeters)**

