

# REMOTE MONITORING AND CONTROL CORROCONTROL-2

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German Cathodic Protection



**CORROCONTROL-2** replaces our old GCP RMCS system.

Cathodic protection systems can only keep their efficiency if they are inspected and maintained at regular intervals. This is often very costly and time consuming, especially, if the systems are installed in remote areas or in hard-to-reach places.

The remote monitoring and control technique enables supervision of separated cathodic protection systems with the help of global communication technology from any point of the world.

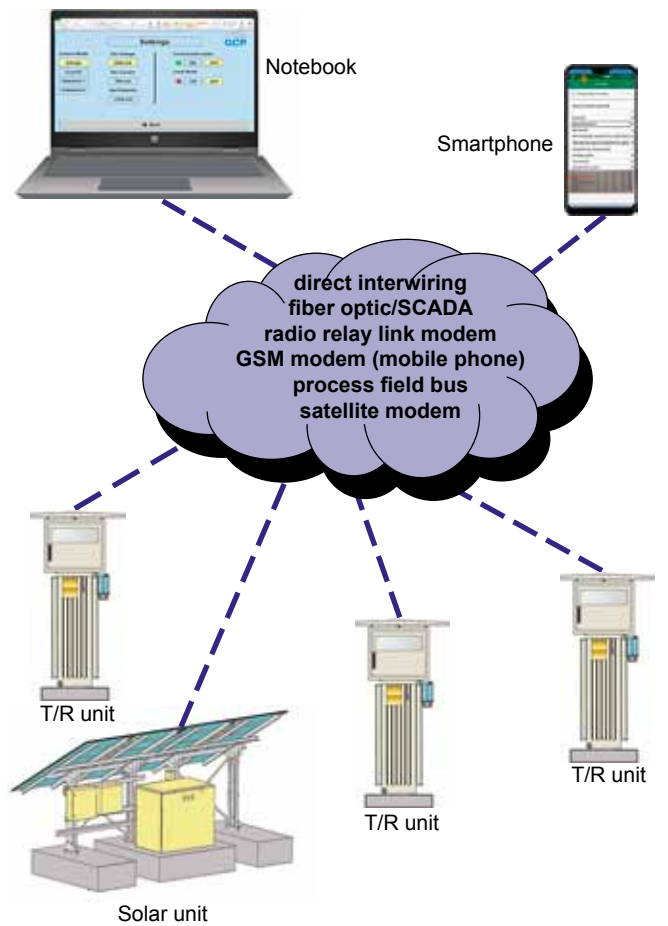
### ...As if you would be on site and have everything under control!

Independent, how far you are away from the location of the cathodic protection stations, it is always ensured that your systems are monitored and controlled.

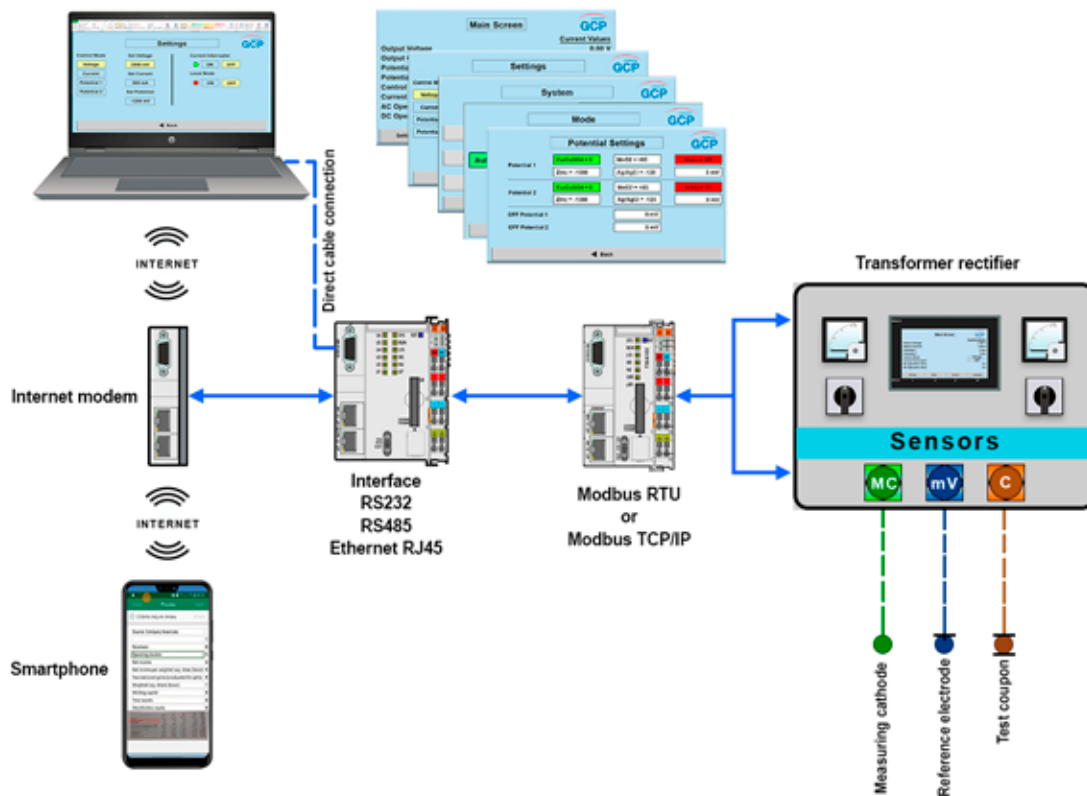
The fundamental functions of CORROCONTROL-2 can be subdivided into several subranges, like entering and alarming, switching, controlling and adjusting, as well as long-term archiving of all system relevant operational data of the connected cathodic protection stations.

### System layout

There are different possibilities to connect the CORROCONTROL-2 unit to the DC power supply (e.g. Transformer Rectifier, DC/DC converter).



The CORROCONTROL-2 can be installed either inside of the TR-Unit compartment or in a separate housing.



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### General

CORROCONTROL-2 is a control unit specially designed for the requirements of cathodic protection systems. CORROCONTROL-2 can be used in all different cathodic protection applications such as pipeline protection, well casing protection, plant protection, internal and external protection of tanks, protection of off-shore structures, protection of steel in concrete, etc.

The main application of CORROCONTROL-2 is the monitoring and control of such impressed current systems as Transformer Rectifiers or DC/DC units.

CORROCONTROL-2 can be operated as a stand-alone system with all parameters adjustable using virtual push buttons on the display of controller, or via serial and/or parallel link from a remote desktop computer.

Different CORROCONTROL-2 units can be connected to one single central computer to create a network in order to control every CORROCONTROL-2 unit from one central monitoring and control station.



CORROCONTROL-2 can function as Output Regulator in existing and new impressed current cathodic protection systems.

CORROCONTROL-2 completely replaces Output Regulator CORROCONTROL, performed in 19"-format and supplied earlier.

CORROCONTROL-2 measures continuously the output voltage and the output current as well as the potential of up to two (2) connected reference electrodes (Cu/CuSO<sub>4</sub>, Ag/AgCl, Zinc or MnO<sub>2</sub>).

The output values are controlled respectively to the chosen operation mode:

- constant voltage,
- constant current,
- constant potential.

This helps to avoid both over-protection and under-protection of the structure against corrosion.



### Basics

CORROCONTROL-2 consists of a 4,3" Multitouch screen as an operating panel, built into box on the front side, control unit and a terminal plug at the back side.



### Reference electrode

The Reference electrode type of the CP System can be one of the following:

- Cu/CuSO<sub>4</sub> (copper-copper sulfate)
- Ag/AgCl (silver-silver chloride)
- Zinc (zinc)
- MnO<sub>2</sub> (manganese oxide)

A second Reference electrode (option) can be connected to the CP System.

The type of connected reference electrode can be selected in the "Potential Settings" of menu "System" of the CORROCONTROL-2 unit in order to display the potential value in respect to Cu/CuSO<sub>4</sub> electrode. This means that when using a Zinc, Ag/AgCl or MnO<sub>2</sub> electrode, the potential value displayed will be automatically converted to the equivalent Cu/CuSO<sub>4</sub> value.

### Cathode connection

We strongly recommend using a separate cathode measuring cable linked to the cathode instead of using a bridge to the main cathode cable since this will avoid misreading of the potential value caused by the voltage drop over the main cathode cable.

### ON/OFF Relay for current interrupter mode

A changer relay contact is available for switching of a current of 2 A. Higher currents can be switched indirectly using external equipment.

The default time cycle is 12 s ON and 3 s OFF as standard.

If necessary, the time cycle can be changed in the "ON / OFF Time Settings" menu.

When selecting current interrupter mode, the relay is active for 3 s and remains inactive for 12 s. While current interrupter mode is activated, the output current and the output voltage cannot be controlled. Control and adjustment is possible again when the current interrupter mode is deactivated.

### RS232 / RS485 / Ethernet interface

Optional RS232/RS485/Ethernet are available for the purpose of monitoring and control of the TR-unit via a connected (directly or via network) computer or PDA with an optional software.

Type of the network is to be agreed in advance.

Network topology for the connection of CORROCONTROL-2 units:

- RS232 – 32 pcs;
- RS485 – 32 pcs;
- Ethernet – 65.000 pcs.



### Functions

CORROCONTROL-2 contains special functions for the control and monitoring of cathodic protection stations.

The operating parameters ("outputs") can be modified using the multi-touch control panel.

### CONSTANT VOLTAGE MODE

automatically maintains the DC output voltage at a set value. The set value can be continuously adjusted between zero and maximum rating.

### CONSTANT CURRENT MODE

automatically maintains the DC output current at a set value. The set value can be continuously adjusted between zero and maximum rating.

### CONSTANT POTENTIAL MODE

automatically maintains the constant output potential at a set value. The set value can be continuously adjusted between zero and maximum rating.

### CURRENT INTERRUPTER MODE

In this mode, the outputs continue to operate in either constant voltage or constant current mode, but operation is interrupted according to the "ON / OFF Time Settings". When current interrupter mode is selected, the corresponding status will be shown in Displays.

### DELTA "U" MODE

DELTA "U" MODE can only be used, if two reference electrodes are connected. If set to this control mode, both electrodes are used for output control. The output is controlled according to the more negative of the two electrode values. Therefore, the potential will be controlled and kept constant at the given set point. The potential will be limited by the current limits (MIN & MAX values).

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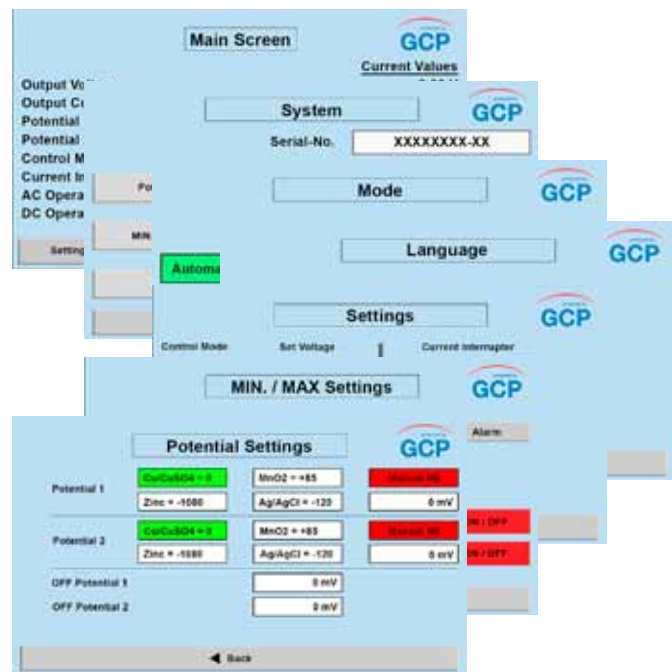
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Display Screens and Menus which are used to operate, control and monitor the outputs. Each output has a touchscreen button which can be pressed to select the controls and functions required. Settings are also modified using touchscreen buttons.



## Specifications

AC Input	115 - 230 V, 50/60 Hz
DC Input	19 - 48 V DC
Power	< 5.0 W
Potential Measurements (2 electrodes)	(-9 V) – (+9 V) DC, >1 MΩ
Shunt Measurements	0 – 60 mV, 1 MΩ
Voltage Measurement	0 – 100V, 120 kΩ
Output, Control Signal (Ust)	0 – 5V DC or 0 – 10V DC
Output, Potential Meter	(-9V) – (+9V) DC
Relay contact for current interrupt mode	2A DC, 2A AC
RS232 / RS485 Mark Condition	-8V DC (approx.)
RS232 / RS485 Space Condition	+8V DC (approx.)
RS232 / RS485 Baud Rate	9600 bit/s
RS232 / RS485 Protocol	8E1
RS232 / RS485 Handshake	None
RS232 Max. Cable Length	10 m
LCD Display Definition	480 x 272
LCD Display Text size	8-12 (Arial)
Dimensions	190 x 150 x 130mm
Weight	approx. 1.50 kg
Operation Temperature	-10 °C to +60 °C