## MiniTrans Plus Remote Monitoring for CP

With the experience gained in the last 20 years by having installed more than 11,000 MiniTrans (MT) in rectifiers and 4,000 in test points, the MiniTransPlus (MTP) with its integrated rectifier control moves remote monitoring for cathodic protection up to a new level.

**Rectifier Control**
**30A Relay Built-in**
**Coupon Measurement**
**Battery Life up to 5Y**
**Threat Detection** (Patent OGE)



GSM transmission
GPS time synchronisation

**Touch Display and Parametrization by Smartphone**
The integrated touch display informs about all measurements and settings.
The parametrization on-site is done by smartphone and a webApp.
The galvanic isolated USB interface allows important system settings by PC/Notebook without smartphone.


4 DC and 4 AC Inputs
30A relay for switching
rectifier regulation

### 4 Inputs with 8 Channel Measurement (DC and AC)
Beside the 3 inputs well known for the old MT, the new MTP got an additional 4th input with a separate GND.
This way the MTP got inputs for 2x voltages (DC+AC), 1x microvolt (DC+AC) and 1x additional voltage / microvolt value (DC+AC) galvanically isolated, resulting in 8 channels altogether.

### Built-in Calibration Cell
On a daily base MTP calibrates itself automatically for factor and´offset with an internal 10V and 10mV calibration cell and 0.1% accuracy. Inputs being out of tolerance or defect are detected by this procedure without the need for manual, external calibration.

### On / Off Measurements and Data Logging combined
As with the old MT, the new MTP measures a few On and Off values on user defined times per day. In addition and automatically all 8 channels are being sampled every second and stored in a ring buffer for daily transmission to the WinTrans 2.0 server in a WinLog 2.0 data logger file format. This way 24/7 data logging with 1s is provided for each MTP installed.

### Coupon Measurement with Internal Relay and Shunt
MTP integrates the same 1ms Coupon measurement as known from the MiniLog2 with Minicoup. The On and Off potential of the coupon, as well as the coupon DC and AC current are measured. Additional to the numeric values, every 5min a 1KHz oscilloscope picture showing the off phase after the switching is transmitted to the WinTrans 2.0 server for evaluation by the user.

### GPS Time Synchronization and Coordinates
The built-in GPS receiver synchronizes with 1ms accuracy and also the GPS coordinates are transferred to the WinTrans 2.0 server. Not only On and/ Off potentials are measured synchronized, but coupon measurements on all test points.

### Rectifier Control in real time with Smartphone
MTP not only switches the rectifier by the MTP internal 30A / 90V electronic relay for measuring On and Off values, but controls and regulates the output voltage or current by Pulse Wide Modulation (PWM).
MTP migrates any existing, non-regulated transformer rectifier into a modern, potential or current regulated rectifier with remote control by Smartphone or WinTrans 2.0 server.

### PipeMon+ (Threat Detection Patent OGE)
In combination with the high resolution of 0.1 µV for the microvolt channel and 10 samples/s with real time transmission to the WinTrans 2.0 server, the MTP does threat detection with the PipeMon+ OGE system.

### WinTrans 2.0 Server Software
The evaluation of all the data from MT and MTP as well as the rectifier control is done with the internet and/or intranet based WinTrans 2.0 software.

## Technical Data
**Remote Monitoring and Remote Control**
**for CP Rectifiers and Test Posts**
with TFT Touch Display, UMTS, GPS, RS232, Bluetooth, galvanic isolated USB and Ethernet (optional)

**Channels**

| | |
|---|---|
| 2x DC + 2x AC | with common ground |
| 1x DC Mic + 1x AC Mic | with common ground |
| 1x DC + 1x AC | galvanically isolated |

Self-testing and calibration of factor and offset with a built-in and 0.1% accuracy reference cell for 10mV and 10V on all inputs.

**Range, Resolution and Impedance**

| | | |
|---|---|---|
| Mik: | ± 10 mV / 0.1 µV | 200 K? (DC + AC) |
| Mik | + CH4: ± 100 mV / 1.0 µV | 200 K? (DC + AC) |
| CH1, 2 and 4: ± 100 V / 0.1 mV | | 10 M? (DC + AC) |

**Measuring Times** (for 8 channel ON and OFF sampling)

| | |
|---|---|
| Normal Mode: | 4 user defined times |
| Diagnose Mode: | every 5, 10, 60 or 120 min |

**Sampling Rates** (Data Logging with Min, Max and Median)

| | |
|---|---|
| 1 channel: | 1000/s (= 1 KHz) |
| 1 - 4 channels: | 10/s, 1s |

**Low Pass Filters and Damping**
16 Hz > 60 dB = Factor 1,000
50 Hz > 100 dB = Factor 100,000

**Internal Ring Buffer**
4 MByte = 2 days with 1s and 4 channels

**SD Card Ring Buffer** (used in case of internal ring buffer overflow)
8GByte = 10 years with 1s and 4 channels

**Input and Output Contacts**
One galvanically isolated input and output each
(i.e. input for door contact and output for alarm contact)

**Time Synchronization**
Built-in GPS receiver (for an external GPS antenna)

**Time Deviation**
± 5ms/1h with hourly GPS reception ± 100ms/24h with no GPS

**Remotely Controlled Switching Cycles**
Resolution 100ms, freely user defined (i.e. 0.8s ON / 0.2s OFF)
User selectable night saving mode

**Switching Power**
Build in electronic relay with 30 A / 90 V

**Coupon measurement**
E-On, E-Off, I-DC, I-AC switched via build in coupon relay
Delay time remotely selectable from 1ms to 200ms after switching

**Rectifier control and regulation** (via patented PWM)
With internal 30A or external 100A relay
Allows standard rectifiers to be remotely regulated (voltage / current)

**Battery and Life time with Internal Battery at Test Points**

| | | |
|---|---|---|
| 3,6V | 5 years: 4x sampling / d 1x transmit / week | |
| 19Ah | 3 years: 4x sampling / d 1x transmit / d | 60min data logging |
| | 2 years: 4x sampling / d 1x transmit / d | 5min data logging |

For all: double life time with additional external battery

**External Power Supply / Solar Power**
DIN rail supply 3.8V / 3A or wall plug transformer, 3.8V / 3A
DC/DC transformer 12V / 3.3V or Kettner solar test post 3.3V / 3A

**Housing, Dimension and Weight**
IP67 for SIM Card and Measurement, 300 x 70 x 38 mm 580 g