

Connection Master Description for Earthfault-Detection-Relay EOR-3D

Version: 1.2

Creation Date: 2018-04-17
Release Date: 2018-05-14

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Distribution:

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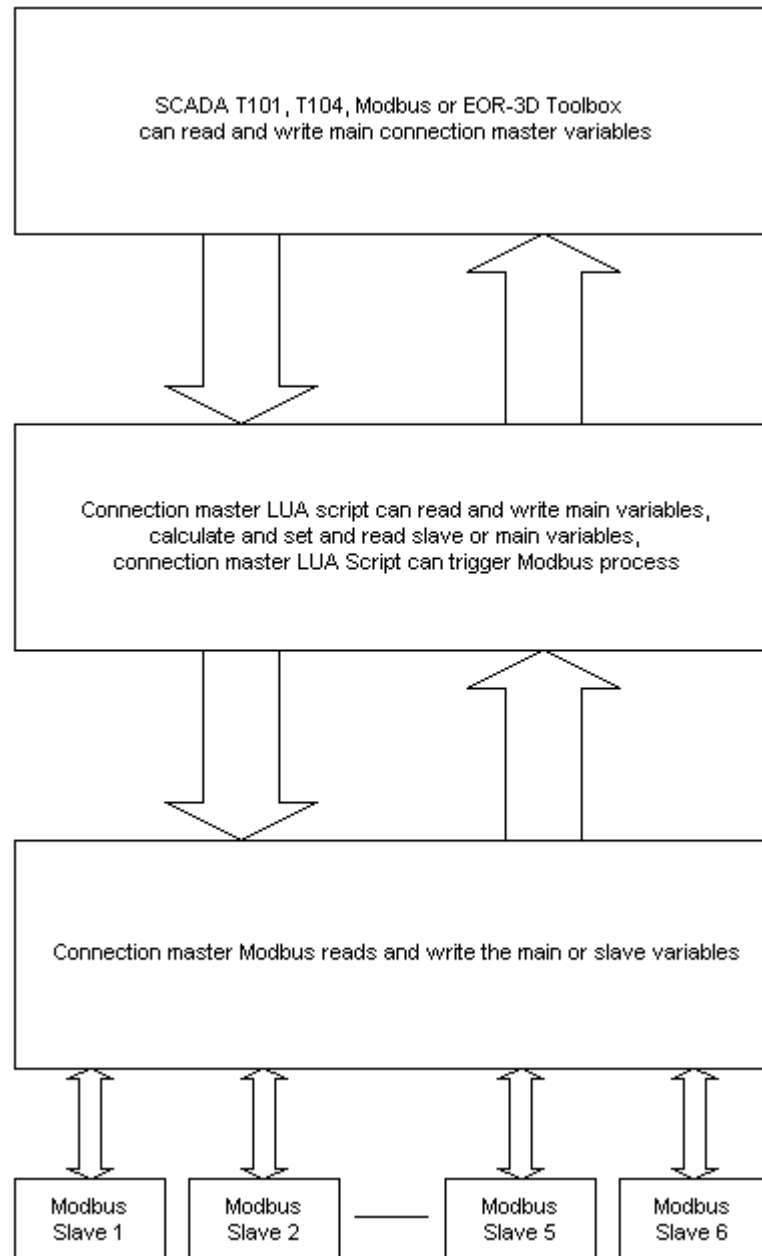
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1 Connection Master

This document describes the characteristics of the Connection Master System – LUA scripts in combination with MODBUS communication protocol of EORD-3D device.

1.1 Design



1.2 LUA

EOR-3D devices can be used to run LUA scripts to do special task or calculations.

1.3 Modbus Protocol

- The EOR-3D devices can be connected to a Modbus Network in order to communicate via RS232 or RS485.
- The EOR-3D connection master can communicate with Modbus Slaves.

1.3.1 Technical characteristics of the MODBUS connection

1.3.2 Parameters of the Serial connection

The different parameters of the MODBUS connection are as follows:

- RS232 connection
- Isolated two-point RS485 connection (2kV 50Hz)
- MODBUS line protocol in RTU mode
- Communication speed can be configured

1.3.3 Transmission mode

Baud rate:

- 9600
- 19200
- 38400
- 57600
- 115200

Mode:

- 1 start / 8 bits / 1 stop: total 10 bits
 - 1 start / 8 bits / even parity / 1 stop: total 11 bits
 - 1 start / 8 bits / odd parity / 1 stop: total 11 bits
 - 1 start / 8 bits / none parity / 2 stop: total 11 bits
- > 1,5 Stopbits are not supported by the Modbus Slave

1.3.4 Toolbox serial configuration RS232/RS484

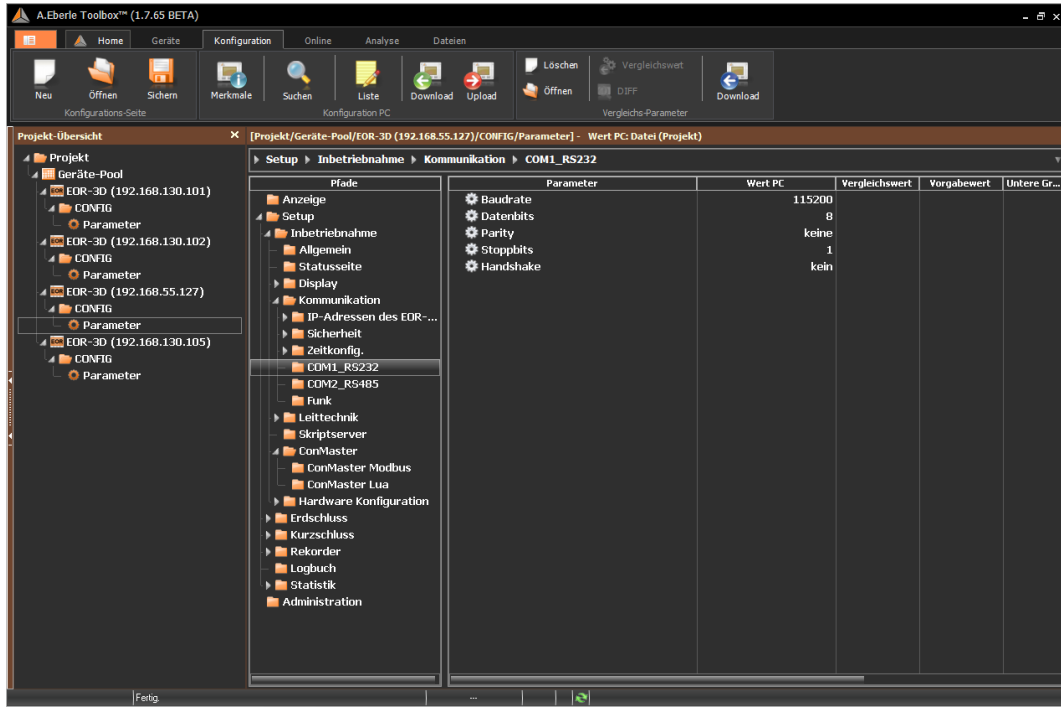


Illustration 1: TB RS232

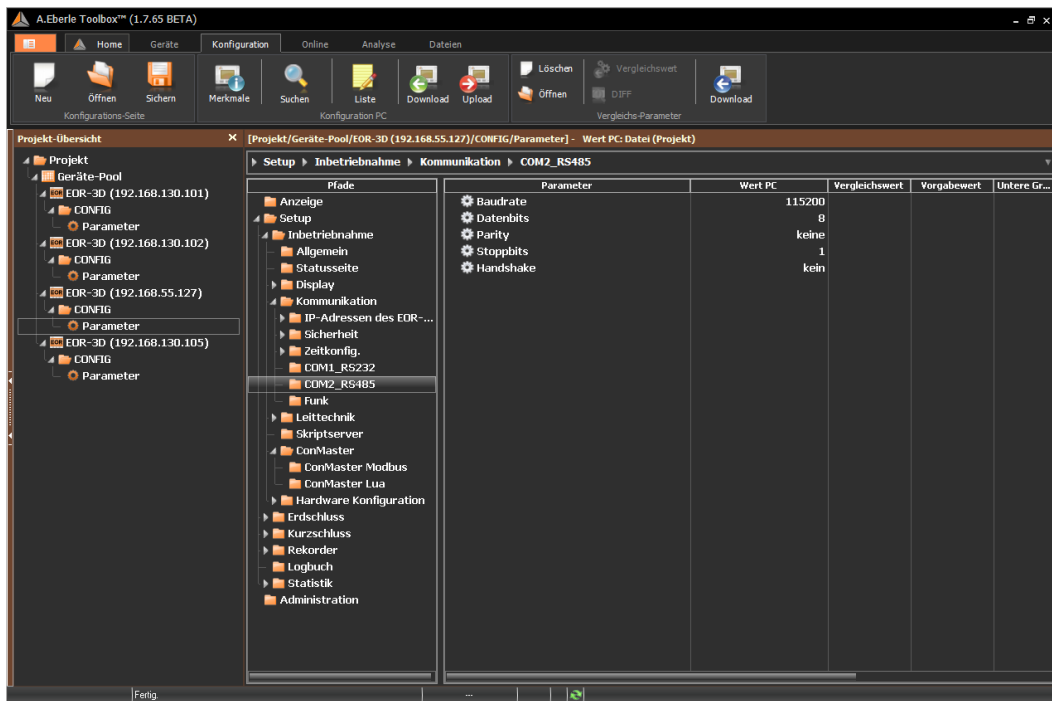


Illustration 2: TB RS484

2 Toolbox Connection Master configuration

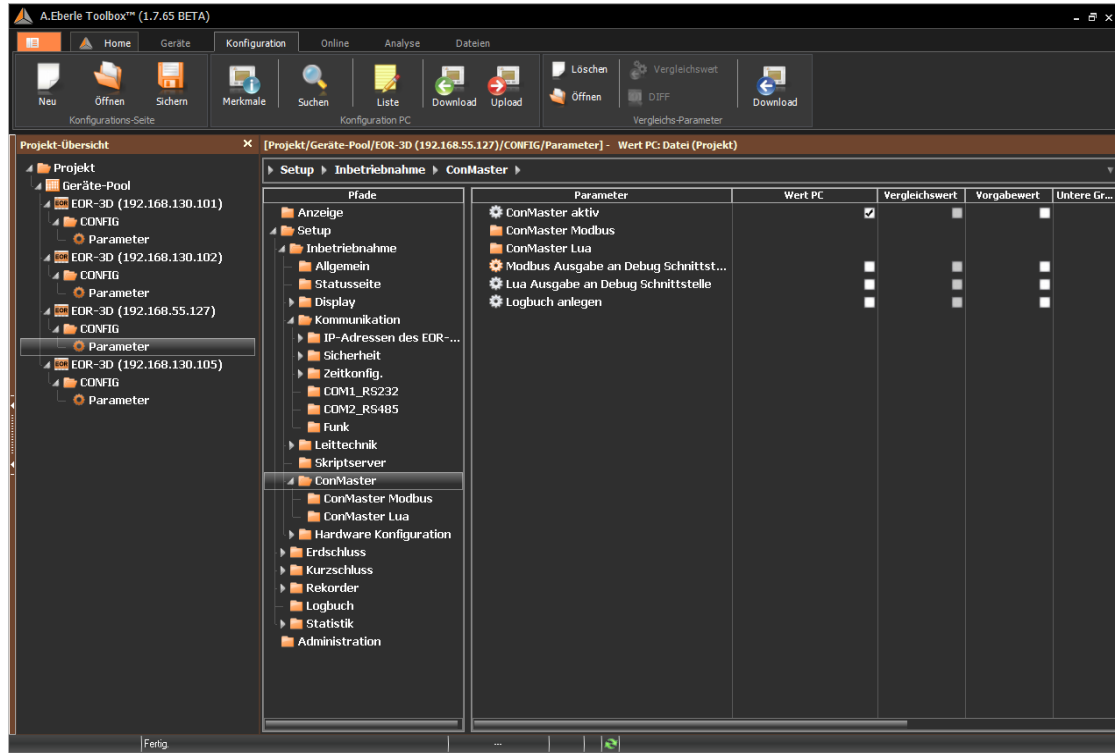


Illustration 3: Toolbox 1

- ConMaster aktiv – enable or disable connection master
- Modbus Ausgaben an der Debug Schnittstelle – enable Debug for Modbus (not for production)
- LUA Ausgaben an der Debug Schnittstelle – enable Debug for LUA (not for production)
- Logbuch anlegen – write Modbus and LUA Debug to Logbook (not for production!)
 - /media/sdcard/logbook/EOR-3D-SCRIPT.log

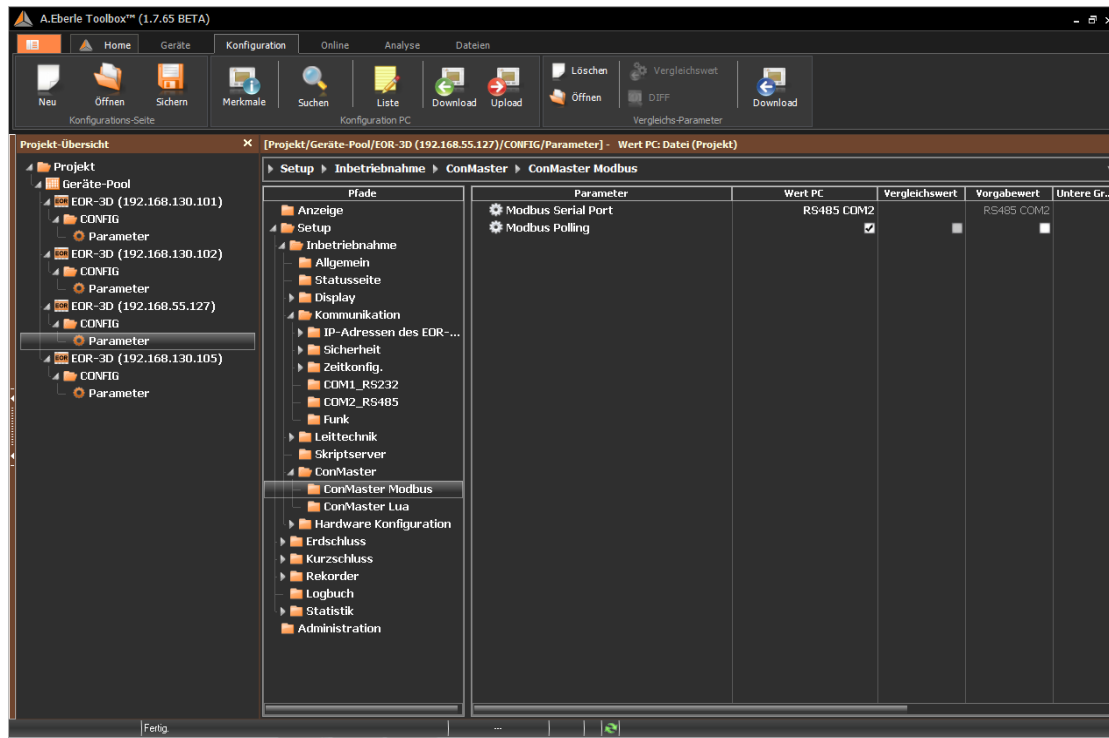


Illustration 4: Toolbox 2

- Modbus Serial Port – configure RS232 or RS 485
- Modbus Polling – do a polling mode for all modbus variables

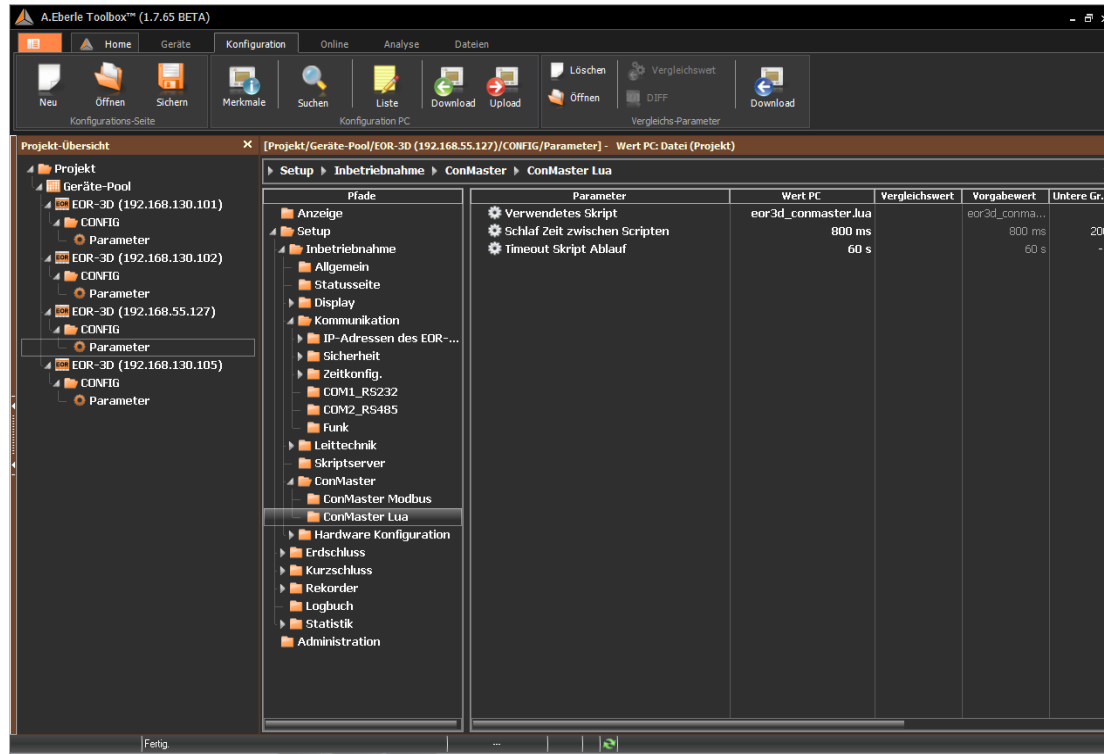


Illustration 5: Toolbox 3

- Verwendetes Skript – used Script
 - eor3d_conmaster.lua
- Schlafzeit zwischen den Scripten – if “Timeout Skript Ablauf” is not > 0, sleep that time between every LUA script run
- Timeout Skript Ablauf – Timeout for the script
 - if -1 do not wait to finish the script, for LUA script with a while loop,
 - Sleep some time in LUA script when using while loops!
 - if > 0 timeout to finish a script

3 Variables

Main and slave virtual variables can be used in the connection master csv to be transferred data to or from a Modbus slave.

3.1.1 Main virtual variables

3.1.2 vBA – Binary Outputs for Read

The EORD-3D has 96 virtual vBA Variables, which can be used for read binary data from a SCADA protocol, like T101, T104 or Modbus.

Toolbox: E3D_vBA 1 to E3D_vBA 96

3.1.3 vBE – Binary Inputs for Write

The EORD-3D has 96 virtual vBE Variables, which can be used to write binary data from a SCADA protocol, like T101, T104 or Modbus.

Toolbox: E3D_vBE 1 to E3D_vBE 96

3.1.4 vMWR – Measurement for Read

The EORD-3D has 96 virtual vMWR Variables, which can be used to read float32 data from a SCADA protocol, like T101, T104 or Modbus.

Toolbox: E3D_vMWR 1 to E3D_vMWR 96

3.1.5 vMWW – Measurement for WRITE

The EORD-3D has 96 virtual vMWW Variables, which can be used to write float32 data from a SCADA protocol, like T101, T104 or Modbus.

Toolbox: E3D_vMWW 1 to E3D_vMWW 96

3.2 Slave virtual variables

The EORD-3D has a virtual address space which can be used for read and written in the LUA scripts and then transfer this variable to or from Modbus slaves. 96 vBA, 96 vBE, 96 vMWR and 96 vMWW are possible like the main virtual variables. These variables can be used to calculate a main virtual variable in combination with an another value of the EOR3D process image.

Toolbox:	E3D_SLvBA	1	to	E3D_SLvBA	96
	E3D_SLvBE	1	to	E3D_SLvBE	96
	E3D_SLvMWR	1	to	E3D_SLvMWR	96
	E3D_SLvMWW	1	to	E3D_SLvMWW	96

3.3 Error Variables

The connection master modbus task has 2 arrays for all possible slave Address(1 to 247).

Toolbox: E3D_conman_status 1 to E3D_conman_status 247
 E3D_conman_error 1 to E3D_conman_error 247

The conman_status sets the variable for a configured slave address from 1 to 247.
If the variable is -1 there is an error in the connection with that slave.
If the variable is 0 the slave address is not configured.
If the variable is 1 there is communication with that slave.

In the error array the register where an error comes from is set.

4 Script Demos

See eor3d_conmaster.lua