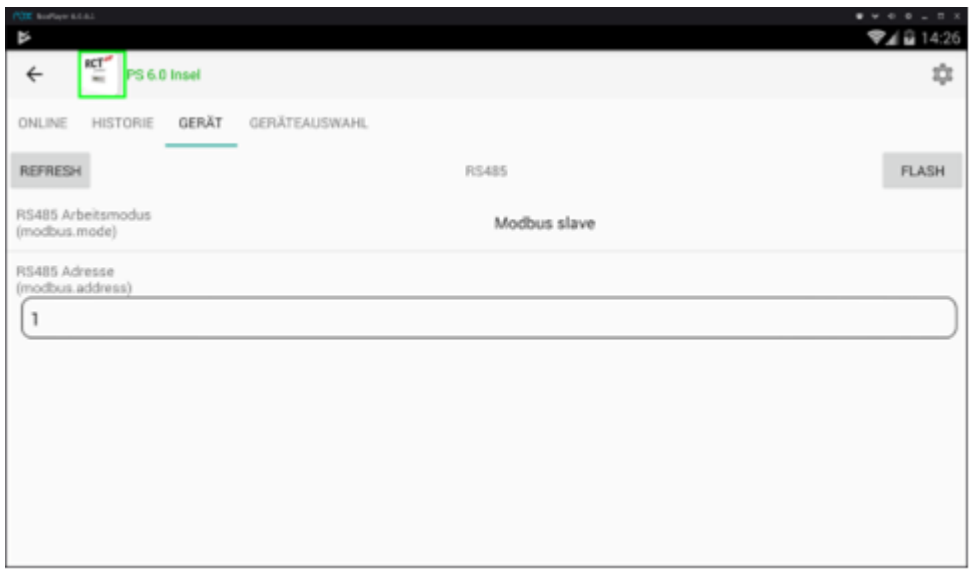
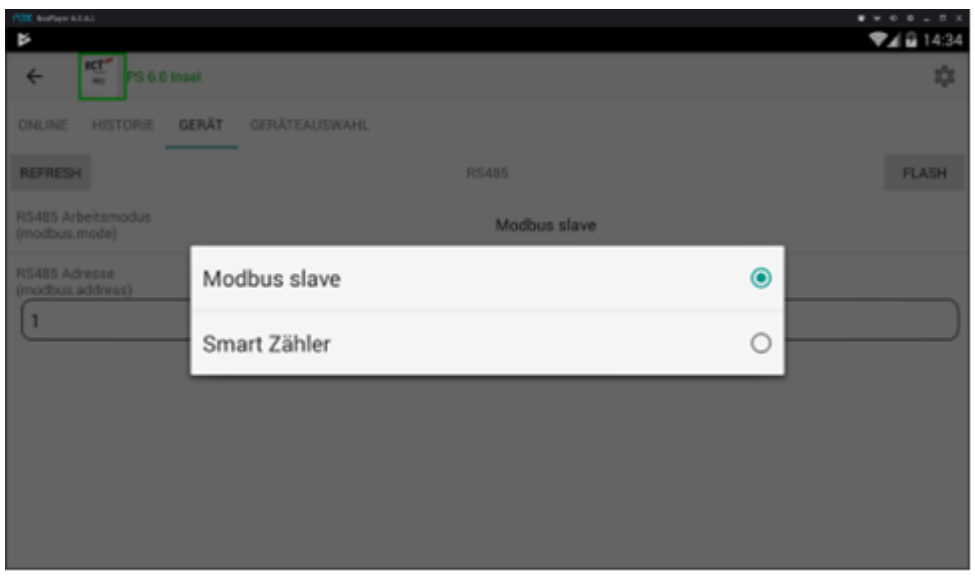
Last edited by **Dmitry Podobedov** right now

RS485 Interface

Version 1.5

RS485 interface can be configured as MODBUS slave or master over the App (Device -> Settings -> Interfaces -> RS485):





If "Modbus slave" selected, the RS485 interface can be used by external devices for serial communication with Inverter using MODBUS V1.1 RTU standard protocol. The RS485 address should be appropriately choosed - this will be the MODBUS slave address of the inverter.

RS485 port settings are follow:

- baudrate: 9600
- coding system: 8-bit binary
- bits per byte: 1 start bit, 8 data bits (least significant bit sent first), no parity, 1 stop bit

For CRC calculation the polynom 0xA001 is used, initialization value is 0xFFFF.

Broadcast address "0" is supported.

Exception response by wrong requests is supported.

Supported function codes:

- 0x03 - read holding registers
- 0x10 - write multiple registers

The table of the avaliable registers is follow:

Register	Variable	Description	Format	Scale	Read/Write
40000		Model	String (32 bytes)		R
40016		Version	String (16 bytes)		R
40024		Serial Number	String (16 bytes)		R
40032		AC Current (Sum of active phases)	int16	0.01 A	R
40033		Phase A Current	int16	0.01 A	R

Register	Variable	Description	Format	Scale	Read/Write
40034		Phase B Current	int16	0.01 A	R
40035		Phase C Current	int16	0.01 A	R
40036		Phase Voltage AB	int16	0.1 V	R
40037		Phase Voltage BC	int16	0.1 V	R
40038		Phase Voltage CA	int16	0.1 V	R
40039		Phase Voltage AN	int16	0.1 V	R
40040		Phase Voltage BN	int16	0.1 V	R
40041		Phase Voltage CN	int16	0.1 V	R
40042		AC Power	int16	1 W	R
40043		Line Frequency	uint16	0.001 Hz	R
40044		AC Apparent Power	int16	1 VA	R
40045		AC Reactive Power	int16	1 VAr	R
40046		AC Power Factor	uint16		R
40047		AC Energy (day)	uint16	10 Wh	R
40048		Current on PV input A	uint16	0.01 A	R
40049		Current on PV input B	uint16	0.01 A	R
40050		Voltage on PV input A	uint16	0.1 V	R
40051		Voltage on PV input B	uint16	0.1 V	R
40052		DC Power	uint16	1 W	R
40053		Heat Sink Temperature	uint16	0.1 °C	R
40054		Heat Sink Temperature (battery conv.)	uint16	0.1 °C	R
40055		Core Temperature	uint16	0.1 °C	R
40056		Operating State	uint16		R
40057		Bitmask value. Event fields.	uint32		R
40059		AC Energy (year)	uint16	1 kWh	R
40060		AC Energy (total)	uint32	1 kWh	R
40062	buf_v_control.power_reduction	Power Reduction (Power Control)	uint16	0.01 %	RW
40063		Insulation	uint16	1 kOhm	R
40064		Power on PV input A	uint16	1 W	R
40065		Power on PV input B	uint16	1 W	R
40066		Bitmask value. Event fields.	uint32		R
40068		Bitmask value. Event fields.	uint32		R
40070		Bitmask value. Event fields.	uint32		R
40072		Time stamp (UNIX)	uint32	1 s	R

Register	Variable	Description	Format	Scale	Read/Write
40074		Number of installed battery units	uint16		R
40075		State of Charge (SOC)	uint16	0.1 %	R
40076		Loaded energy	uint16	100 Wh	R
40077		Battery capacity	uint16	100 Wh	R
40078		Max discharge power	uint16	1 W	R
40079		Max charge power	uint16	1 W	R
40080		Battery power (positive = discharge)	int16	1 W	R
40081		Grid Power: Negative - feed-in, positive - consumption.	int16	10 W	R
40093	buf_v_control.power_reduction	Power Reduction (Power Control)	uint16	0.01 %	RW
40162	buf_v_control.power_reduction_max_solar	Installed PV power	uint16	1 W	RW
40242	buf_v_control.power_reduction	Power Reduction (Power Control)	uint16	0.01 %	RW
40243	modbus.var_id	Access ID	uint32		RW
40245		Access Data	data dependent (max 134 bytes)		R
40246	energy.e_grid_feed_total	Total energy grid feed-in [Wh]. Negative.	float		R
40247	energy.e_grid_load_total	Total energy grid load [Wh]. Positive.	float		R
40248	energy.e_ac_total	Total energy (inverter output) [Wh]. Negative - feed-in, positive - consumption.	float		R
40249	energy.e_dc_total[0]	Solar generator A total energy [Wh]. Positive.	float		R
40250	energy.e_dc_total[1]	Solar generator B total energy [Wh]. Positive.	float		R
40251	battery.stored_energy	Total energy flow into battery [Wh]. Positive.	float		R
40252	battery.used_energy	Total energy flow from battery [Wh]. Positive.	float		R
40253	energy.e_load_total	Household total energy [Wh]. Positive = consumption.	float		R

- Note 1: float is 32-bit IEEE 754 standard for floating point
- Note 2: bytes order in word MSBF, words order (float) MSWF

Data Access

Data access is an extention for the existing registers collection, which allowes access to nearly 1000 different inverter parameters. To read the appropriate value, it's ID should be written to the Access ID register. Than, the value itself is accessible over the Access Data register. Some of the available data ID's:

ID	Variable	Type	Description
0x44D4C533	energy.e_grid_feed_total	float	Total energy grid feed-in [Wh]. Negative.
0x62FBE7DC	energy.e_grid_load_total	float	Total energy grid load [Wh]. Positive.

ID	Variable	Type	Description
0xB1EF67CE	energy.e_ac_total	float	Total energy [Wh]
0xFC724A9E	energy.e_dc_total[0]	float	Solar generator A total energy [Wh]
0x68EEFD3D	energy.e_dc_total[1]	float	Solar generator B total energy [Wh]
0x5570401B	battery.stored_energy	float	Total energy flow into battery [Wh]
0xA9033880	battery.used_energy	float	Total energy flow from battery [Wh]

- Note 1: float is 32-bit IEEE 754 standard for floating point
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Faults

There are two classes of the faults

- Inverter faults
- Battery (BMS) faults

The faults are bit-coded in four 32-bit variables, where each bit is reserved for one fault, so there are 4 x 32 faults at all. Bit 0 of the „fault[0].flt“ variable corresponds fault index 0.

Variable	Fault indexes	Register
fault[0].flt	0..31	40057
fault[1].flt	32..63	40066
fault[2].flt	64..95	40068
fault[3].flt	96..127	40070