# REMOTE POWER CONTROL INTERFACE REGISTER
# Version 1.42

## WRITE AND READ VALUES (without Hybrid EMS)

**Data type: Little-Endian, byte swapped**

If the setpoint is written to register 5000, it remains valid for the valid time (register 5006).

A further setpoint command resets the expiration timer and the setpoint command is active again for the valid time (register 5006).

Alternatively, register 5008 (watchdog) can be written instead of sending a new setpoint command to reset the expiration timer.

In case a new value gets written into register 5006 this will reset the expiration timer.

If the watchdog register is written after the valid time has expired, the setpoint remains invalid and a new setpoint command must be set.

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| 5000 | PPC_P_SET_RPC_REL | Active power setpoint (relative, 3rd party) | % | F32 | -10,000…125 | Write values between 0...100 % up to firmware 14.0.5. Write values between 0...125 % from firmware 15.1.8. Write values between -10,000...125 % from firmware 23.2.11. |
| 5002 | PPC_P_SET_RPC_ABS | Active power setpoint (absolute, 3rd party) | W | F32 | | From firmware 33.0.10 |
| 5004-5005 | | Reserved. Possible to write / read from firmware 16.0.4. | | | | |
| 5006 | PPC_RPC_VALID_TIME | | min | F32 | 1…255 min (Default: 10 min) | |
| 5008 | PPC_RPC_WATCHDOG | | - | F32 | - | |

## READ VALUES (without Hybrid EMS)

**Data type: Little-Endian, byte swapped**

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| 0 | PPC_P_AC_INV | Inverter active power | W | F32 | 0… 1,000,000,000.000 W | |
| 2 | PPC_P_AC_FEED_IN | Actual feed-in power at grid connection point (actual value) | W | F32 | Active power value from selected meter at RPC | From firmware 29.0.9<br>Negative values = import,<br>Positive values = export |
| 4 | PPC_P_SET_REL | Active power setpoint | % | F32 | -10,000.000 … 125.000 % | Read values between 0...100 %<br>up to firmware 14.0.5.<br>Read values between 0...125 %<br>from firmware 15.1.8.<br>Read values between -10,000...125 %<br>from firmware 23.2.11. |
| 6 | PPC_P_SET_GRIDOP_REL | Active power setpoint (grid operator) | % | F32 | -10,000.000 … 125.000 % | Read values between 0...100 %<br>up to firmware 14.0.5.<br>Read values between 0...125 %<br>from firmware 15.1.8.<br>Read values between -10,000...125 %<br>from firmware 23.2.11. |
| 8 | PPC_P_SET_RPC_REL | Active power setpoint (3rd party) | % | F32 | -10,000.000 … 125.000 % | Read values between 0...100 %<br>up to firmware 14.0.5.<br>Read values between 0...125 %<br>from firmware 15.1.8.<br>Read values between -10,000...125 %<br>from firmware 23.2.11. |
| 10 | PPC_P_AC_GRIDOP_MAX | Maximum active power at power limitation (grid operator) | W | F32 | 0… 1,000,000,000.000 W | PPC_P_AV x PPC_P_SET_GRIDOP_REL<br>(PAV = 1.000.000 W,<br>PPC_P_SET_GRIDOP_REL = 50 % →<br>PPC_P_AC_GRIDOP_MAX = 500.000 W). |
| 12 | PPC_P_AC_RPC_MAX | Maximum active power at power limitation (3rd party) | W | F32 | 0… 1,000,000,000.000 W | From firmware 16.0.4<br>PPC_P_AV x PPC_P_SET_RPC_REL<br>(PAV = 1.000.000 W,<br>PPC_P_SET_RPC_REL = 60 % →<br>PPC_P_AC_RPC_MAX = 600.000 W). |

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| 14 | PPC_P_SET_MODE | Active power control method (*) | - | F32 | 0: No configuration found<br>1: Fixed value method without interface (continuous limitation)<br>2: Fixed value method Pvar DI<br>3: Fixed value method Pvar AI<br>4: Fixed value method Pvar Modbus<br>5: Remote Power Control (RPC)<br>100: LFSM-O (**)<br>101: LFSM-U (3*)<br>102: FSM (4*)<br>112: RPC & FSM (5*)<br>120: Controller freeze (undervoltage) (6*)<br>121: Controller freeze (overvoltage) (6*)<br>200: Fail-safe operation (last valid setpoint)<br>201: Fail-safe operation (default setpoint)<br>202: Fail-safe operation (system fallback setpoint)<br>203: Fail-safe operation (Automatic grid disconnection) | (*) From firmware 16.0.4<br>(**) From firmware 17.0.11<br>(3*) From firmware 19.2.10<br>(4*) From firmware 25.0.13<br>(5*) From firmware 33.1.12<br>(6*) From firmware 34.1.5 |
| 16 | PPC_P_SET_LFSMO_REL | Active power setpoint (LFSM-O) | % | F32 | | |
| 18 | PPC_P_SET_LFSMU_REL | Active power setpoint (LFSM-U) | % | F32 | | |
| 20 | PPC_GHI | Actual global irradiation | W/m² | F32 | | From firmware 23.0.8 |
| 22 | PPC_T_AMBIENT | Actual ambient temperature | °C | F32 | | From firmware 23.0.8 |
| 24 | PPC_P_AC_AVAIL | Available active power | W | F32 | | From firmware 25.0.13 |
| 26 | PPC_Q_AC_AVAIL | Available reactive power | Var | F32 | | From firmware 25.0.13 |
| 28 | PPC_INV_INST | Number of installed inverters | - | F32 | | From firmware 29.0.9 |
| 30 | PPC_INV_AVAIL | Number of active inverters | - | F32 | | From firmware 29.0.9 |
| 32 | PPC_BAT_SOC | State of charge relative | % | F32 | | From firmware 33.1.12 |
| 34 | PPC_BAT_SOC_ABS | State of charge absolute | Wh | F32 | | From firmware 33.1.12 |
| 36 | PPC_BAT_CAP | Battery capacity | Wh | F32 | | From firmware 33.1.12 |
| 38 | PPC_BAT_P_AC_INV | Sum of inverter active power (battery) | W | F32 | | From firmware 33.1.12 |
| 40 | PPC_PV_P_AC_INV | Sum of inverter active power (PV) | W | F32 | | From firmware 33.1.12 |
| 42 | PPC_F_AC | Grid frequency | Hz | F32 | | From firmware 33.1.12 |
| 44 | PPC_P_SET_RPC_ABS | Absolute active power setpoint (3rd party) | W | F32 | | From firmware 33.0.10 |
| 46-99 | | Reserved | | | | |

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| 100 | PPC_P_AC_INV | Inverter active power | W | I32 | 0… 1,000,000,000.000 W | |
| 102 | PPC_P_AC_FEED-IN | Actual feed-in power at grid connection point (actual value) | W | I32 | Active power value from selected meter at RPC | Negative values = import,<br>Positive values = export.<br>From firmware 32.0.6. In previous versions, the value came from the selected meter at power control. |
| 104 | PPC_P_SET_REL | Active power setpoint | % | I32 | -10,000.000 … 125.000 % | Read values between 0...100 %<br>up to firmware 14.0.5.<br>Read values between 0...125 %<br>from firmware 15.1.8.<br>Read values between -10,000...125 %<br>from firmware 23.2.11. |
| 106 | PPC_P_SET_GRIDOP_REL | Active power setpoint (grid operator) | % | I32 | -10,000.000 … 125.000 % | Read values between 0...100 %<br>up to firmware 14.0.5.<br>Read values between 0...125 %<br>from firmware 15.1.8.<br>Read values between -10,000...125 %<br>from firmware 23.2.11. |
| 108 | PPC_P_SET_RPC_REL | Active power setpoint (3rd party) | % | I32 | -10,000.000 … 125.000 % | Read values between 0...100 %<br>up to firmware 14.0.5.<br>Read values between 0...125 %<br>from firmware 15.1.8.<br>Read values between -10,000...125 %<br>from firmware 23.2.11. |
| 110 | PPC_P_AC_GRIDOP_MAX | Maximum active power at power limitation (grid operator) | W | I32 | 0… 1,000,000,000.000 W | PPC_P_AV x PPC_P_SET_GRIDOP_REL<br>(PAV = 1.000.000 W,<br>PPC_P_SET_GRIDOP_REL = 50 % →<br>PPC_P_AC_GRIDOP_MAX = 500.000 W). |
| 112 | PPC_P_AC_RPC_MAX | Maximum active power at power limitation (3rd party) | W | I32 | 0… 1,000,000,000.000 W | PPC_P_AV x PPC_P_SET_RPC_REL<br>(PAV = 1.000.000 W,<br>PPC_P_SET_RPC_REL = 60 % →<br>PPC_P_AC_RPC_MAX = 600.000 W). |

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| 114 | PPC_P_SET_MODE | Active power control method (*) | - | I32 | 0: No configuration found<br>1: Fixed value method without interface (continuous limitation)<br>2: Fixed value method Pvar DI<br>3: Fixed value method Pvar AI<br>4: Fixed value method Pvar Modbus<br>5: Remote Power Control (RPC)<br>100: LFSM-O (**)<br>101: LFSM-U (3*)<br>102: FSM (4*)<br>112: RPC & FSM (5*)<br>120: Controller freeze (undervoltage) (6*)<br>121: Controller freeze (overvoltage) (6*)<br>200: Fail-safe operation (last valid setpoint)<br>201: Fail-safe operation (default setpoint)<br>202: Fail-safe operation (system fallback setpoint)<br>203: Fail-safe operation (Automatic grid disconnection) | (*) From firmware 16.0.4<br>(**) From firmware 17.0.11<br>(3*) From firmware 19.2.10<br>(4*) From firmware 25.0.13<br>(5*) From firmware 33.1.12<br>(6*) From firmware 34.1.5 |
| 116 | PPC_P_SET_LFSMO_REL | Active power setpoint (LFSM-O) | % | I32 | | |
| 118 | PPC_P_SET_LFSMU_REL | Active power setpoint (LFSM-U) | % | I32 | | |
| 120 | PPC_GHI | Actual global irradiation | W/m² | I32 | | |
| 122 | PPC_T_AMBIENT | Actual ambient temperature | °C | I32 | | From firmware 23.0.8 |
| 124 | PPC_P_AC_AVAIL | Available active power | W | I32 | | From firmware 25.0.13 |
| 126 | PPC_Q_AC_AVAIL | Available reactive power | Var | I32 | | From firmware 25.0.13 |
| 128 | PPC_INV_INST | Number of installed inverters | - | I32 | | From firmware 23.0.8 |
| 130 | PPC_INV_AVAIL | Number of active inverters | - | I32 | | From firmware 29.0.9 |
| 132 | PPC_BAT_SOC | State of charge | % | I32 | | From firmware 33.1.12 |
| 134 | PPC_BAT_SOC_ABS | State of charge absolute | Wh | I32 | | From firmware 33.1.12 |
| 136 | PPC_BAT_CAP | Battery capacity | Wh | I32 | | From firmware 33.1.12 |
| 138 | PPC_BAT_P_AC_INV | Sum of inverter active power (battery) | W | I32 | | From firmware 33.1.12 |
| 140 | PPC_PV_P_AC_INV | Sum of inverter active power (PV) | W | I32 | | From firmware 33.1.12 |
| 142 | PPC_F_AC | Grid frequency | Hz | I32 | | From firmware 33.1.12 |
| 144 | PPC_P_SET_RPC_ABS | Absolute active power setpoint (3rd party) | W | I32 | | From firmware 33.0.10 |
| 146-3999 | | Reserved | | | | |

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| 3900 | PPC_QS_TS | Current timestamp of device | --- | U32 | | This value returns a current timestamp for device health detection.<br>From firmware 34.2.6 |
| 3902 | PPC_RPC_V_MAJOR | Remote Power Control major version | - | U16 | | |
| 3903 | PPC_RPC_V_MINOR | Remote Power Control minor version | - | U16 | | |
| 4000 | PPC_P_AV_E | Agreed connected active power PAV | W | F32 | 0… 1,000,000,000.000 W | |

# REMOTE POWER CONTROL INTERFACE REGISTER (HYBRID EMS) Version 2.1

## WRITE AND READ VALUES (only with Hybrid EMS)

**Data type: Little-Endian, byte swapped**

For each setpoint, two registers must be written: one for activation (0/1) and one for the setpoint value.

If the setpoint value register is written while the activation register remains set to 0, the setpoint will not be processed.

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| | | ***GRID CONNECTION POINT (GCP)*** | | | | |
| 10000 | PPC_RPC_GCP_P_LIM_REL_ACT | Activation "Active power feed-in limitation at GCP (energy trader, relative)" | - | F32 | 0 = off, 1 = on | This command is only relevant for hybrid systems. For PV or battery standalone systems use the plant specific setpoint. |
| 10002 | PPC_RPC_GCP_P_LIM_REL | Active power feed-in limitation at GCP (energy trader, relative) | % | F32 | 0 … 125 % | This command is only relevant for hybrid systems. For PV or battery standalone systems use the plant specific setpoint. |
| 10004 | PPC_RPC_GCP_P_LIM_ABS_ACT | Activation "Active power feed-in limitation at GCP (energy trader, absolute)" | - | F32 | 0 = off, 1 = on | This command is only relevant for hybrid systems. For PV or battery standalone systems use the plant specific setpoint. |
| 10006 | PPC_RPC_GCP_P_LIM_ABS | Active power feed-in limitation at GCP (energy trader, absolute) | W | F32 | unlimited | This command is only relevant for hybrid systems. For PV or battery standalone systems use the plant specific setpoint. |
| 10008-1098 | | Reserved | | | | |
| | | ***PV*** | | | | |
| 10100 | PPC_RPC_PV_P_SET_REL_ACT | Activation "Active power setpoint PV (energy trader, relative)" | - | F32 | 0 = off, 1 = on | |
| 10102 | PPC_RPC_PV_P_SET_REL | Active power setpoint PV (energy trader, relative) | % | F32 | 0 … 125 % | |
| 10104 | PPC_RPC_PV_P_SET_ABS_ACT | Activation "Active power setpoint PV (energy trader, absolute)" | - | F32 | 0 = off, 1 = on | |
| 10106 | PPC_RPC_PV_P_SET_ABS | Active power setpoint PV (energy trader, absolute) | W | F32 | unlimited | |
| 10108 | PPC_RPC_PV_FSM_ACT | Activation FSM for PV | - | F32 | 0 = off, 1 = on | |
| 10110 | PPC_RPC_PV_FSM_P_RANGE | FSM active power range for PV | % | F32 | 0....125% | Applicable if FSM curve is configured as symmetrical. |

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| 10112 | PPC_RPC_PV_FSM_P_RANGE_U | FSM active power range - underfrequency for PV | % | F32 | 0....125% | Applicable if FSM curve is configured as asymmetrical. |
| 10114 | PPC_RPC_PV_FSM_P_RANGE_O | FSM active power range - overfrequency for PV | % | F32 | 0....125% | Applicable if FSM curve is configured as asymmetrical. |
| 10116 | PPC_RPC_PV_FSM_DROOP | FSM droop for PV | % | F32 | 0.001 …100% | Applicable if FSM curve is configured as symmetrical. |
| 10118 | PPC_RPC_PV_FSM_DROOP_U | FSM droop - underfrequency for PV | % | F32 | 0.001 …100% | Applicable if FSM curve is configured as asymmetrical. |
| 10120 | PPC_RPC_PV_FSM_DROOP_O | FSM droop - overfrequency for PV | % | F32 | 0.001 …100% | Applicable if FSM curve is configured as asymmetrical. |
| 10122-10198 | | Reserved | | | | |
| | | ***BATTERY*** | | | | |
| 10200 | PPC_RPC_BAT_P_SET_REL_ACT | Activation "Active power setpoint battery (energy trader, relative)" | - | F32 | 0 = off, 1 = on | |
| 10202 | PPC_RPC_BAT_P_SET_REL | Active power setpoint battery (energy trader, relative) | % | F32 | -125 … 125 % | |
| 10204 | PPC_RPC_BAT_P_SET_ABS_ACT | Activation "Active power setpoint battery (energy trader, absolute)" | - | F32 | 0 = off, 1 = on | |
| 10206 | PPC_RPC_BAT_P_SET_ABS | Active power setpoint battery (energy trader, absolute) | W | F32 | unlimited | |
| 10208 | PPC_RPC_BAT_FSM_ACT | Activation FSM for battery | - | F32 | 0 = off, 1 = on | |
| 10210 | PPC_RPC_BAT_FSM_P_RANGE | FSM active power range for battery | % | F32 | 0....125% | Applicable if FSM curve is configured as symmetrical. |
| 10212 | PPC_RPC_BAT_FSM_P_RANGE_U | FSM active power range - underfrequency for battery | % | F32 | 0....125% | Applicable if FSM curve is configured as asymmetrical. |
| 10214 | PPC_RPC_BAT_FSM_P_RANGE_O | FSM active power range - overfrequency for battery | % | F32 | 0....125% | Applicable if FSM curve is configured as asymmetrical. |

## READ VALUES (only with Hybrid EMS)

**Data type: Little-Endian, byte swapped**

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| | | ***GENERAL*** | | | | |
| 3900 | PPC_QS_TS | Current timestamp of device | - | U32 | | This value returns a current timestamp for device health detection.<br>From firmware 34.2.6 |
| 3902 | PPC_RPC_V_MAJOR | Remote Power Control major version | - | U16 | | |
| 3903 | PPC_RPC_V_MINOR | Remote Power Control minor version | - | U16 | | |
| 4000 | PPC_P_AV_E | Agreed connected active power $P_{AV}$ | W | F32 | | |
| 4002-5000 | | Reserved | | | | |
| 5100 | PPC_GCP_P_LIM_FEEDIN_REL | Active power feed-in limitation (grid operator, relative) | % | F32 | | |
| 5102 | PPC_GCP_P_LIM_FEEDIN_ABS | Active power feed-in limitation (grid operator, absolute) | W | F32 | | |
| 5104 | PPC_GCP_P_LIM_IMPORT_REL | Active power import limitation (grid operator, relative) | % | F32 | | |
| 5106 | PPC_GCP_P_LIM_IMPORT_ABS | Active power import limitation (grid operator, absolute) | W | F32 | | |
| 5108-5198 | | Reserved | | | | |
| | | | | | | |
| | | ***PV*** | | | | |
| 5200 | PPC_PV_P_LIM_REL | Active power generation limitation PV (grid operator, relative) | % | F32 | | |
| 5202 | PPC_PV_P_LIM_ABS | Active power generation limitation PV (grid operator, absolute) | W | F32 | | |
| 5204 | PPC_PV_LFSMO_P_SET_REL | Active power setpoint (LFSM-O) | % | F32 | | |
| 5206 | PPC_PV_LFSMU_P_SET_REL | Active power setpoint (LFSM-U) | % | F32 | | |
| 5208 | PPC_PV_FSM_P_SET_REL | Active power setpoint (FSM) | % | F32 | | |
| 5210 | PPC_PV_FSM_DELTA_P | Active power change calculated by FSM curve | % | F32 | | |
| 5212 | PPC_PV_P_AC_INV | Sum of inverter active power (PV) | W | F32 | | This value corresponds to the sum of all PV inverters connected to the master and slave devices. |
| 5214 | | Reserved | | | | |
| 5216 | PPC_PV_INV_INST | Number of installed inverters (PV) | - | F32 | | |
| 5218 | PPC_PV_INV_AVAIL | Number of active inverters (PV) | - | F32 | | |
| 5220-5298 | | Reserved | | | | |

| Register | Abbreviation | Description | Unit | Data type | Range | Comment |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | ***BATTERY*** | | | |
| 5300 | PPC_BAT_P_LIM_CHARGE_REL | Active power charge limitation battery (grid operator, relative) | % | F32 | | |
| 5302 | PPC_BAT_P_LIM_CHARGE_ABS | Active power charge limitation battery (grid operator, absolute) | W | F32 | | |
| 5304 | PPC_BAT_P_LIM_DISCHARGE_REL | Active power discharge limitation battery (grid operator, relative) | % | F32 | | |
| 5306 | PPC_BAT_P_LIM_DISCHARGE_ABS | Active power discharge limitation battery (grid operator, absolute) | W | F32 | | |
| 5308 | PPC_BAT_LFSMO_P_SET_REL | Active power setpoint (LFSM-O) | % | F32 | | |
| 5310 | PPC_BAT_LFSMU_P_SET_REL | Active power setpoint (LFSM-U) | % | F32 | | |
| 5312 | PPC_BAT_FSM_P_SET_REL | Active power setpoint (FSM) | % | F32 | | |
| 5314 | PPC_BAT_FSM_DELTA_P | Active power change calculated by FSM curve | % | F32 | | |
| 5316 | PPC_BAT_P_AC_INV | Sum of inverter active power battery | W | F32 | | This value corresponds to the sum of all battery inverters connected to the master and slave devices. |
| 5318 | PPC_BAT_SOC | State of charge relative | % | F32 | | |
| 5320 | PPC_BAT_SOC_ABS | State of charge absolute | Wh | F32 | | |
| 5322 | PPC_BAT_CAP | Battery capacity | Wh | F32 | | |
| 5324-5398 | | Reserved | | | | |
| | | | | | | |
| | | | ***MEASURED DATA*** | | | |
| 5400 | PPC_GHI | Actual global irradiation | W/m² | F32 | | |
| 5402 | PPC_T_AMBIENT | Actual ambient temperature | °C | F32 | | |
| 5404 | PPC_F_AC_PF | Grid frequency | Hz | F32 | | Measured frequency used for frequency control LFSM-U, LFSM-O and FSM |
| 5406 | PPC_P_AC_FEED_IN | Active power at grid connection point | W | F32 | | Active power value from selected meter at RPC. |
| 5408-9998 | | Reserved | | | | |