

## AMPERFIED WALLBOX CONNECT SERIES

# Modbus TCP Register Layout

Version 1.0.8 – Version 2.0.1

This document describes the use of the implemented register layout for Modbus TCP communication.

- ➔ Please do not use registers that are not described in this document or are not intended for use by the user.
- ➔ Please check on our homepage that you have the latest version of this Modbus documentation so that you can take into account possible changes to the register layout.

<https://www.amperfied.de/de/service-support/downloads/>

- ➔ Please refer the original manual of the Wallbox for further information.

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<b>Configuration .....</b>	<b>4</b>
Connection by IP address.....	4
Connection by Host Name .....	4
Communication Port.....	4
<b>Register Layout: General.....</b>	<b>5</b>
[004] Modbus TCP Register Layout Version.....	5
[005] Charging State .....	6
[006 - 008] Current.....	7
[009] Temperature (PCB).....	8
[010 - 012] Voltage .....	9
[013] Extern Lock State.....	10
[014] Power.....	11
[015 - 016] Energy since Power on.....	12
[017 -018] Energy since Installation .....	13
[019 -020] Energy during charge cycle.....	14
[100] Hardware configuration maximal current.....	15
[101] Hardware configuration minimal current .....	15
[102 - 133] Logistic String .....	16
[200] Hardware Variant .....	17
[203] Application Software Revision.....	17
[257] WatchDog TimeOut.....	18
[259] Remote Lock .....	19
[261] Maximal Current Command.....	20
[262] FailSafe Current.....	21
[300 - 318] Support Diagnostic Data .....	22
[500 - 819] Error Memory .....	22
<b>Register Layout: Logistic Data .....</b>	<b>23</b>
[1000 - 1017] Wallbox Serial Number .....	23
[1050 - 1067] Wallbox Item Number .....	24
[1100 - 1117] Date of Production.....	25
[1250 - 1290] Firmware Version .....	26
[1300 - 1340] Firmware Variant.....	27
<b>Register Layout: RFID Card Handling.....</b>	<b>28</b>
[300] RFID Configuration Commands.....	28
[301] RFID Control Commands.....	29

[302] RFID Admission Command.....	30
[2000] RFID Card Counter.....	31
[2001] RFID UID Length.....	32
[2002 - 2007] RFID UID.....	33
[2008 - 2017] RFID Card Serial Number.....	34
[2018] RFID Security Type.....	35
[2019] Charging Permission.....	36
[2020] Wallbox Ready for Charging.....	37
[2100] RFID Status Information.....	38

### **Register Layout: Internal MID Power Meter.....39**

[3000] MID available internally.....	39
[3001 - 3003] Internal MID Current.....	40
[3004 – 3006] Internal MID Voltage.....	41
[3007] Internal MID Power Forward.....	42
[3008 - 3009] Internal MID Energy Forward since Installation.....	43
[3010] Internal MID Power Reverse.....	44
[3011 - 3012] Internal MID Energy Reverse since Installation.....	45
[3100 - 3150] Internal MID Serial Number.....	46

### **Register Layout: Internal Power Data .....47**

[3500 - 3502] Internal HCB Current.....	47
[3503 – 3505] Internal HCB Voltage.....	48
[3506] Internal HCB Power.....	49
[3507 – 3508] Internal HCB Energy since Power on.....	50
[3509 -3510] Internal HCB Energy since Installation.....	51

### **Register Layout: Phase Switch ..... 52**

[501] Phase Switch Control.....	52
[5001] Phase Switch State.....	53

## Configuration

### Connection by IP address

The IP address under which the Wallbox can be reached in the network must be used for communication.

It is recommended to set the IP address permanently for Modbus TCP Communication.

### Connection by Host Name

#### Host Name

The Wallbox can also be found and addressed in the network via its host name, provided that the network router supports this.

The host's name consists of a defined device designation ("HDM-SMART-CONNECT-") and the last six characters of the MAC address on the communication module

#### Example

HDM-SMART-CONNECT-F431F2

#### Notice

With some routers, e.g., the FRITZ!Box, devices in the network can be reached with their host name as a subdomain, e.g. <https://hdm-smart-connect-f431f2.fritz.box/>

### Communication Port

#### Port Number

The TCP port 502 is used for Modbus TCP communication.

#### Notice

Please note that only one connection can be established on this port at a time.

## Register Layout: General

### [004] Modbus TCP Register Layout Version

#### Description

This register can be read to check the Modbus Register Layouts Version. This is important for correct use of registers.

#### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

#### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
4	R	04 - readInputRegister	uint16	0..65536

#### Examples

The value contained in the register is in hexadecimal format. To determine the register layout version, no conversion to the decimal system is necessary. Instead, the individual digits of the hexadecimal number represent the version directly.

- decimal 256 ↔ hexadecimal 0x100 ↔ Version V1.0.0
- decimal 264 ↔ hexadecimal 0x108 ↔ Version V1.0.8

#### Notice

The register layout version is not the same as the software version of the Wallbox.

## [005] Charging State

### Description

This register represents the current charging state between the vehicle and the Wallbox.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
5	R	04 - readInputRegister	uint16	1..11

### Examples

Value	State	Car	Wallbox
2	A1	No vehicle plugged	Wallbox doesn't allow charging
3	A2		Wallbox allows charging
4	B1	Vehicle plugged without charging request	Wallbox doesn't allow charging
5	B2		Wallbox allows charging
6	C1	Vehicle plugged with charging request	Wallbox doesn't allow charging
7	C2		Wallbox allows charging
8	---	---	Derating
9	E	Error	Error
10	F	---	Wallbox locked or not ready
11	---	---	Error

### Notice

The charging states refer to the EN 61851-1 standard. Please see more details there.

## [006 - 008] Current

### Description

These registers represent the current rms drawn by the vehicle from the Wallbox per phase L1, L2, L3.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
<b>6</b>	R	04 - readInputRegister	uint16	L1: 0...350	Ampere rms in steps of 0.1 A
<b>7</b>	R	04 - readInputRegister	uint16	L2: 0...350	Ampere rms in steps of 0.1 A
<b>8</b>	R	04 - readInputRegister	uint16	L3: 0...350	Ampere rms in steps of 0.1 A

### Examples

- 1 = 0.1 A rms
- 145 = 14.5 A rms

### Notice

If an internal MID power meter is present, these values contain the measured data of the MID power meter. If there is no internal MID power meter, these values are for internal use only and not for billing purposes.

## [009] Temperature (PCB)

### Description

This register represents the internal temperature of the Wallbox.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
9	R	04 - readInputRegister	int16	-2000 ... +2000	°C in steps of 0.1 °C

### Examples

- 325 = +32.5 °C
- -145 = -14.5 °C



## [010 – 012] Voltage

### Description

This register represents the current voltage rms, provided by the connection point per phase.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
<b>10</b>	R	04 - readInputRegister	uint16	<i>L1 - N</i> 0...65536	Volt in steps of 1 V
<b>11</b>	R	04 - readInputRegister	uint16	<i>L2 - N</i> 0...65536	Volt in steps of 1 V
<b>12</b>	R	04 - readInputRegister	uint16	<i>L3 - N</i> 0...65536	Volt in steps of 1 V

### Examples

- 8 = 8 V rms
- 238 = 238 V rms
- 258 = 258 V rms

### Notice

If an internal MID power meter is present, these values contain the measured data of the MID power meter. If there is no internal MID power meter, these values are for internal use only and not for billing purposes.

## [013] Extern Lock State

### Description

This register represents the status of the input for external lock (see manual).

### Layout Version

The availability of registers depends on the layout version within the connect series.

<b>connect.home</b>	<b>connect.business</b>	<b>connect.solar</b>
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

<b>Bus-Adr.</b>	<b>R/W</b>	<b>Modbus TCP Function</b>	<b>Type</b>	<b>Range</b>
<b>13</b>	R	04 - readInputRegister	uint16	0 or 1

### Examples

- 0 = system locked
- 1 = system unlocked

## [014] Power

### Description

This register represents the sum of the power of all three phases (Power L1 + Power L2 + Power L3) consumed by the connected vehicle.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
14	R	04 - readInputRegister	uint16	0..65536	VA in steps of 1 VA

### Examples

- 1000 → 1.000 kVA
- 9814 → 9.841 kVA
- 11000 → 11.000 kVA

### Notice

If an internal MID power meter is present, these values contain the measured data of the MID power meter. If there is no internal MID power meter, these values are for internal use only and not for billing purposes.

## [015 - 016] Energy since Power on

### Description

Electrical energy drawn from the vehicles since the last time the Wallbox was switched on.

It is a 32bit number represented in two 16bit registers (see examples).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Description	Range	Unit
<b>15</b>	R	04 - readInputRegister	uint16	Energy since Power On [high byte]	0..65536	VAh in steps of 2 <sup>16</sup> VAh
<b>16</b>	R	04 - readInputRegister	uint16	Energy since Power On [low byte]	0..65536	VAh in steps of 1 VAh

### Examples

- high Byte = 1 → 1 \* 2<sup>16</sup> VAh = 65536 VAh  
 low byte = 1000 → 1000 VAh  
 ⇒ Result: 65536 VAh + 1000 VAh = 66536 VAh
- high Byte = 5 → 5 \* 2<sup>16</sup> VAh = 327680 VAh  
 low byte = 37 → 37 VAh  
 ⇒ Result: 327680 VAh + 37 VAh = 327717 VAh

### Notice

These values are for internal use only and not for billing purposes.

## [017 -018] Energy since Installation

### Description

Electrical energy drawn by the vehicles since commissioning of the Wallbox. The register content is not lost when the Wallbox is disconnected from the mains. A reset is not possible.

It is a 32bit number represented in two 16bit registers (see examples).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Description	Range	Unit
17	R	04 - readInputRegister	uint16	Energy since Installation [high byte]	0..65536	VAh in steps of 2 <sup>16</sup> VAh
18	R	04 - readInputRegister	uint16	Energy since Installation [Low byte]	0..65536	VAh in steps of 1 VAh

### Examples

- high Byte = 10 → 10 \* 2<sup>16</sup> VAh = 655360 VAh  
 low byte = 100 → 100 VAh  
 ⇒ Result: 655360 VAh + 100 VAh = 655460 VAh
- high Byte = 23 → 23 \* 2<sup>16</sup> VAh = 1507328 VAh  
 low byte = 1974 → 1974 VAh  
 ⇒ Result: 1507328 VAh + 1974 VAh = 1509302 VAh

### Notice

If an internal MID power meter is present, these values contain the measured data of the MID power meter. If there is no internal MID power meter, these values are for internal use only and not for billing purposes.

## [019 -020] Energy during charge cycle

### Description

Electrical energy drawn by the vehicle since start of a charging cycle.

It is a 32bit number represented in two 16bit registers (see examples).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Description	Range	Unit
<b>19</b>	R	04 - readInputRegister	uint16	Energy during charge cycle [high byte]	0..65536	VAh in steps of $2^{16}$ VAh
<b>20</b>	R	04 - readInputRegister	uint16	Energy during charge cycle [Low byte]	0..65536	VAh in steps of 1 VAh

### Examples

- high Byte = 1 →  $1 * 2^{16}$  VAh = 65536 VAh  
 low byte = 1000 → 1000 VAh  
 ⇒ Result: 65536 VAh + 1000 VAh = 66536 VAh
- high Byte = 5 →  $5 * 2^{16}$  VAh = 327680 VAh  
 low byte = 37 → 37 VAh  
 ⇒ Result: 327680 VAh + 37 VAh = 327717 VAh

### Notice

If an internal MID power meter is present, these values contain the measured data of the MID power meter. If there is no internal MID power meter, these values are for internal use only and not for billing purposes.

## [100] Hardware configuration maximal current

### Description

In this register the configuration of the hardware switch in the Wallbox can be read (see Manual).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
100	R	04 - readInputRegister	uint16	0..16	Ampere in steps of 1 A

### Examples

- 6 = 6 A
- 16 = 16 A

## [101] Hardware configuration minimal current

### Description

In this register the minimal current of the Wallbox can be read. The value not changeable by Hardware or Software.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
101	R	04 - readInputRegister	uint16	6	Ampere

## [102 - 133] Logistic String

### Description

This block of registers contains a logistic string for internal use. Each Register represents two ASCII characters.

### Layout Version

The availability of registers depends on the layout version within the connect series.

<b>connect.home</b>	<b>connect.business</b>	<b>connect.solar</b>
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

<b>Bus-Adr.</b>	<b>R/W</b>	<b>Modbus TCP Function</b>	<b>Type</b>	<b>Range</b>	
<b>102</b>	R	04 - readInputRegister	char[2]	ASCII	
...	R	04 - readInputRegister	char[2]	ASCII	
<b>133</b>	R	04 - readInputRegister	char[2]	ASCII	

### Notice

Reserved by manufacturer. Only for internal use.



## [200] Hardware Variant

### Description

In this register hardware variants are described for internal use.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type		
200	R	04 - readInputRegister	uint16		

### Notice

Reserved by manufacturer. Only for internal use.

## [203] Application Software Revision

### Description

The register contains the Revision Number of the Application Software.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type		
203	R	04 - readInputRegister	uint16		

### Notice

Reserved by manufacturer. Only for internal use.

## [257] WatchDog TimeOut

### Description

This register is used for communication monitoring and sets WatchDog TimeOut for the Modbus TCP Leader. Within this time period, at least one successful Modbus TCP communication must have taken place between the Modbus TCP Leader and the Modbus TCP Follower. Otherwise, the Modbus TCP Follower goes into TimeOut mode.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
257	R / W	03 - readHoldingRegister 06 - writeHoldingRegister	uint16	0...65536	Seconds in steps of 0.001 s

### Default Value

15000 = 15.000 s

### Examples

- 10000 = 10.000 s
- 9523 = 9.523 s
- 0 = Off, i.e., WatchDog deactivated

### Notice

After Power On the stored value is retained.

## [259] Remote Lock

### Description

This Register can be used to read and write the Remote lock.  
 It works only, if extern lock is unlocked. The extern lock has priority.  
 If you lock the system with register 259, this is indicated to the user by the LED.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
259	R / W	06 - writeHoldingRegister	uint16	0 or 1

### Default Value

1 = system unlocked

### Examples

- 0 = system locked
- 1 = system unlocked

### Notice

After Power On the stored value is retained.

## [261] Maximal Current Command

### Description

This Register can be used to read and write the maximal current.

The system can be locked by setting 0 in register 261. However, this is not displayed to the user. It is noticed that the charging does not start or is terminated.

The unit for this value is ampere in steps of 0.1 A

It is recommended to leave the current setting constant for 20 sec. after a change.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
261	R/W	03 - readHoldingRegister 06 - writeHoldingRegister	uint16	[0; 60 to 160]	Ampere in steps of 0.1 A

### Default Value

The default value 0, i.e., 0 A.

### Examples

- 160 = 16 A
- 100 = 10 A
- 1...59 → not allowed, is interpreted as 0 A → means no charging possible
- 0 → is interpreted as 0 A → means no charging possible

## [262] FailSafe Current

### Description

FailSafe Current configuration in case of loss of Modbus TCP communication. The FailSafe current will be used for charging, if TimeOut Mode is activated (see Register 257 WatchDog TimeOut).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
262	R/W	03 - readHoldingRegister 06 - writeHoldingRegister	uint16	0 60 to 160	Ampere in steps of 0.1 A

### Default Value

The default value 0, i.e., 0 A.

### Examples

- 0 → 0.0 A, i.e., no charging possible
- 1...59 → not allowed, is interpreted as 0.0 A, i.e., no charging possible
- 60 = 6.0 A
- 160 = 16.0 A

### Notice

After Power On the stored value is retained.

## [300 - 318] Support Diagnostic Data

### Description

Register Area for Support Diagnostic Data.

### Layout Version

The availability of registers depends on the layout version within the connect series.

<b>connect.home</b>	<b>connect.business</b>	<b>connect.solar</b>
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

<b>Bus-Adr.</b>	<b>R/W</b>	<b>Modbus TCP Function</b>	<b>Type</b>		
<b>300</b>	R	04 - readInputRegister	uint16		
...	R	04 - readInputRegister	uint16		
<b>318</b>	R	04 - readInputRegister	uint16		

### Notice

Reserved by manufacturer. Only for internal use.

## [500 - 819] Error Memory

### Description

Register Area for Error Memory.

### Layout Version

The availability of registers depends on the layout version within the connect series.

<b>connect.home</b>	<b>connect.business</b>	<b>connect.solar</b>
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

<b>Bus-Adr.</b>	<b>R/W</b>	<b>Modbus TCP Function</b>	<b>Type</b>		
<b>500</b>	R	04 - readInputRegister	int16		
...	..	..	..		
<b>819</b>	R	04 - readInputRegister	int16		

### Notice

Reserved by manufacturer. Only for internal use.

## Register Layout: Logistic Data

### [1000 - 1017] Wallbox Serial Number

#### Description

This block of registers contains the serial number of the Wallbox.

Each Register represents two ASCII characters.

Zero byte represents the end of the serial number. Registers padded with 0x0000

#### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

#### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
<b>1000</b>	R	04 - readInputRegister	char[2]	ASCII
...	R	04 - readInputRegister	char[2]	ASCII
<b>1017</b>	R	04 - readInputRegister	char[2]	ASCII

#### Examples

012345 means the serial number 012345.

## [1050 - 1067] Wallbox Item Number

### Description

This block of registers contains the item number of the wallbox.

Each Register represents two ASCII characters.

Zero byte represents the end of the item number. Registers padded with 0x0000

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
<b>1050</b>	R	04 - readInputRegister	char[2]	ASCII
...	R	04 - readInputRegister	char[2]	ASCII
<b>1067</b>	R	04 - readInputRegister	char[2]	ASCII

### Examples

00.779.2965 means the item number 00.779.2965



## [1100 - 1117] Date of Production

### Description

This block of registers contains the date of production based on week and year. Each Register represents two ASCII characters. Zero byte represents the end of date of production. Registers padded with 0x0000

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
<b>1100</b>	R	04 - readInputRegister	char[2]	ASCII
...	R	04 - readInputRegister	char[2]	ASCII
<b>1117</b>	R	04 - readInputRegister	char[2]	ASCII

### Examples

1723 means calendar week 17 and year 23 as date of production.

## [1250 - 1290] Firmware Version

### Description

This block of registers contains the firmware version of the wallbox.

Each Register represents two ASCII characters.

Zero byte represents the end of the firmware version. Registers padded with 0x0000

### Layout Version

The availability of registers depends on the layout version within the connect series.

<b>connect.home</b>	<b>connect.business</b>	<b>connect.solar</b>
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

<b>Bus-Adr.</b>	<b>R/W</b>	<b>Modbus TCP Function</b>	<b>Type</b>	<b>Range</b>
<b>1250</b>	R	04 - readInputRegister	char[2]	ASCII
...	R	04 - readInputRegister	char[2]	ASCII
<b>1290</b>	R	04 - readInputRegister	char[2]	ASCII

### Examples

V2.0.0 means Firmware V2.0.0

## [1300 - 1340] Firmware Variant

### Description

This block of registers contains the firmware version of the wallbox.

Each Register represents two ASCII characters.

Zero byte represents the end of the firmware variant. Registers padded with 0x0000

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
<b>1300</b>	R	04 - readInputRegister	char[2]	ASCII
...	R	04 - readInputRegister	char[2]	ASCII
<b>1340</b>	R	04 - readInputRegister	char[2]	ASCII

### Examples

HDM for Amperfiend Wallbox.

# Register Layout: RFID Card Handling

## [300] RFID Configuration Commands

### Description

This register allows to configure the RFID handling in the Wallbox. Please note: the commands are hexadecimal numbers.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
300	R / W	03 - readHoldingRegister 06 - writeHoldingRegister	uint16	0x1000 ... 0x1005

### Values

Value	Command
0x1000	Disable internal Whitelist
0x1001	Activate internal Whitelist
0x1002	Disable RFID Card Security
0x1003	Active RFID Card Security
0x1004	Disable Authentication
0x1005	Activate Authentication

### Notice

If the register is used for reading, 0x0000 is returned. Please use input register 2100 to read out the status.

## [301] RFID Control Commands

### Description

This register allows to control the RFID handling in the Wallbox.  
Please note: the commands are hexadecimal numbers.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
<b>301</b>	R / W	03 - readHoldingRegister 06 - writeHoldingRegister	uint16	0x2002 0x2003 0x2004 0x2008

### Values

Value	Command
0x2002	Start Teaching RFID Card
0x2003	Cancel Teaching RFID Card
0x2004	RFID Card accepted by Modbus Controller (one time blinking green LED and beeping buzzer)
0x2008	RFID Card rejected by Modbus Controller (three times blinking red LED and beeping buzzer)

### Notice

If the register is used for reading, 0x0000 is returned.

## [302] RFID Admission Command

### Description

This register enables the RFID card to be admitted in the Wallbox.  
Please note: the commands are hexadecimal numbers.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
<b>302</b>	R / W	03 - readHoldingRegister 06 - writeHoldingRegister	uint16	0x3001

### Values

Value	Command
0x3001	Allow RFID card

### Notice

If the register is used for reading, 0x0000 is returned.

## [2000] RFID Card Counter

### Description

This register counts the accepted RFID cards used on the Wallbox.

### Layout Version

The availability of registers depends on the layout version within the connect series.

<b>connect.home</b>	<b>connect.business</b>	<b>connect.solar</b>
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

<b>Bus-Adr.</b>	<b>R/W</b>	<b>Modbus TCP Function</b>	<b>Type</b>	<b>Range</b>
<b>2000</b>	R	04 - readInputRegister	uint16	0..65536

### Default Value

0 counts = 0x0000

16 counts = 0x0010

## [2001] RFID UID Length

### Description

This register represents the length of the UID by the current used RFID card.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
2001	R	04 - readInputRegister	uint16	0..65536

### Default Value

0 digits = 0

### Examples

UID = 04 49 62 FA BA 10 90.

The value 7 in the register means that the UID is 7 bytes long.



## [2002 - 2007] RFID UID

### Description

This block of registers represents the UID by the current used RFID card.

The values are hexadecimal.

Each UID consists of 12 Bytes (Byte 0 up to Byte 11).

Each register represents two bytes of the UID.

Zero byte represents the end of the UID. Registers padded with 0000.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Content
<b>2002</b>	R	04 - readInputRegister	uint16	0..65536	UID Byte 0 and Byte 1
<b>2003</b>	R	04 - readInputRegister	uint16	0..65536	UID Byte 2 and Byte 3
<b>2004</b>	R	04 - readInputRegister	uint16	0..65536	UID Byte 4 and Byte 5
<b>2005</b>	R	04 - readInputRegister	uint16	0..65536	UID Byte 6 and Byte 7
<b>2006</b>	R	04 - readInputRegister	uint16	0..65536	UID Byte 8 up to Byte 9
<b>2007</b>	R	04 - readInputRegister	uint16	0..65536	UID Byte 10 and Byte 11

### Default Value

0000 0000 0000 0000 0000 0000

### Example

UUID = 04 49 62 FA BA 10 90 means

- Reg [2002] = 0449
- Reg [2003] = 62FA
- Reg [2004] = BA10
- Reg [2005] = 9000
- Reg [2006] = 0000
- Reg [2007] = 0000

## [2008 - 2017] RFID Card Serial Number

### Description

This block of registers represents the serial number by the current used RFID card.

The values are the ascii coded card number.

Each serial number consists of 20 characters (char 0 up to char 19)

Each register represents two characters of the serial number.

Zero byte represents the end of the card number. Registers padded with 0000.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Content
2008	R	04 - readInputRegister	char[2]	ASCII	Char 0 and Char 1
2009	R	04 - readInputRegister	char[2]	ASCII	Char 2 up to Char 3
2010	R	04 - readInputRegister	char[2]	ASCII	Char 4 up to Char 5
2011	R	04 - readInputRegister	char[2]	ASCII	Char 6 up to Char 7
2012	R	04 - readInputRegister	char[2]	ASCII	Char 8 up to Char 9
2013	R	04 - readInputRegister	char[2]	ASCII	Char 10 up to Char 11
2014	R	04 - readInputRegister	char[2]	ASCII	Char 12 up to Char 13
2015	R	04 - readInputRegister	char[2]	ASCII	Char 14 up to Char 15
2016	R	04 - readInputRegister	char[2]	ASCII	Char 16 up to Char 17
2017	R	04 - readInputRegister	char[2]	ASCII	Char 18 and Char 19

### Default Value

00 00 00 00 00 00 00 00 00 00

### Example

Card Number = 00 04 05 50 79 18 97 04 11 56

- Reg [2008] = 3030
- Reg [2009] = 3034
- Reg [2010] = 3035
- Reg [2011] = 3530
- Reg [2012] = 3739
- Reg [2013] = 3138
- Reg [2014] = 3937
- Reg [2015] = 3034
- Reg [2016] = 3131
- Reg [2017] = 3536

Card Number																									
0	0	0	4	0	5	5	0	7	9	1	8	9	7	0	4	1	1	5	6						
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓						
Reg [2008]	Reg [2009]			Reg [2010]			Reg [2011]			Reg [2012]			Reg [2013]			Reg [2014]			Reg [2015]			Reg [2016]			Reg [2017]
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII		
30	30	30	34	30	35	35	30	37	39	31	38	39	37	30	34	31	31	35	36						

## [2018] RFID Security Type

### Description

This register represents the security type of the current used RFID card.

### Layout Version

The availability of registers depends on the layout version within the connect series.

<b>connect.home</b>	<b>connect.business</b>	<b>connect.solar</b>
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

<b>Bus-Adr.</b>	<b>R/W</b>	<b>Modbus TCP Function</b>	<b>Type</b>	<b>Range</b>
<b>2018</b>	R	04 - readInputRegister	uint16	0 or 1

### Default Value

0 = no secure card

### Examples

Value	RFID Card
0	No secure card
1	secure card by Amperfiend

## [2019] Charging Permission

### Description

This register represents the source of permission of the current charging process. Please note: the register is only used with an active internal whitelist of the Wallbox.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
<b>2019</b>	R	04 - readInputRegister	uint16	0...5

### Default Value

0 = no permission

### Examples

Value	Permission
0	no permission
1	via RFID
2	via Web Browser
3	via App
4	via OCPP
5	via Modbus

## [2020] Wallbox Ready for Charging

### Description

This register shows whether the Wallbox is ready for charging.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
<b>2020</b>	R	04 - readInputRegister	uint16	0 or 1

### Examples

Value	State
0	Wallbox available
1	Wallbox ready for charging

### Default Value

0 = Wallbox available

## [2100] RFID Status Information

### Description

This register shows summary state of RFID handling in the Wallbox.  
Please note: the Information is structured as a bit array.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
2020	R	04 - readInputRegister	uint16	

### Values

Bit	Value	State
0	0	Internal Whitelist disabled
	1	Internal Whitelist activated
1	0	RFID card security disabled
	1	RFID card security activated
2	0	Authentication disabled
	1	Authentication activated

### Default Value

Bit	Value	State
0	0	Internal Whitelist disabled
1	0	RFID card security disabled
2	0	Authentication disabled

## Register Layout: Internal MID Power Meter

### [3000] MID available internally

#### Description

This register shows if there is an internal MID power meter in the Wallbox.

#### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

#### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Range
<b>3000</b>	R	04 - readInputRegister	0 or 1

#### Values

Value	Availability
0	Internal MID not available
1	Internal MID available

## [3001 - 3003] Internal MID Current

### Description

These registers represent the internal MID current rms drawn by the vehicle from the Wallbox per phase L1, L2, L3.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
<i>not available</i>	≥ V 2.0.0	<i>not available</i>

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
<b>3001</b>	R	04 - readInputRegister	uint16	MID L1: 0...350	Ampere rms in steps of 0.1 A
<b>3002</b>	R	04 - readInputRegister	uint16	MID L2: 0...350	Ampere rms in steps of 0.1 A
<b>3003</b>	R	04 - readInputRegister	uint16	MID L3: 0...350	Ampere rms in steps of 0.1 A

### Examples

- 1 = 0.1 A rms
- 145 = 14.5 A rms



## [3004 – 3006] Internal MID Voltage

### Description

This register represents the internal MID voltage rms, provided by the connection point per phase.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
not available	≥ V 2.0.0	not available

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
<b>3004</b>	R	04 - readInputRegister	uint16	<i>MID L1 - N</i> 0...65536	Volt in steps of 1 V
<b>3005</b>	R	04 - readInputRegister	uint16	<i>MID L2 - N</i> 0...65536	Volt in steps of 1 V
<b>3006</b>	R	04 - readInputRegister	uint16	<i>MID L3 - N</i> 0...65536	Volt in steps of 1 V

### Examples

- 8 = 8 V rms
- 238 = 238 V rms
- 258 = 258 V rms

## [3007] Internal MID Power Forward

### Description

This register represents the sum of the power of all three phases (Power L1 + Power L2 + Power L3) delivered to the vehicle. The power input is measured by the internal MID power meter.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
<i>not available</i>	≥ V 2.0.0	<i>not available</i>

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
<b>3007</b>	R	04 - readInputRegister	uint16	0..65536	VA in steps of 1 VA

### Examples

- 1000 → 1.000 kVA
- 9814 → 9.841 kVA
- 11000 → 11.000 kVA

## [3008 - 3009] Internal MID Energy Forward since Installation

### Description

Energy delivered to the vehicle since the wallbox was put into service. The power input is measured by the internal MID power meter.

The register content is not lost when the wallbox is disconnected from the mains. A reset is not possible.

It is a 32bit number represented in two 16bit registers (see examples).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 1.0.8	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Description	Range	Unit
<b>3008</b>	R	04 - readInputRegister	uint16	Energy since Installation [high byte]	0..65536	VAh in steps of $2^{16}$ VAh
<b>3009</b>	R	04 - readInputRegister	uint16	Energy since Installation [Low byte]	0..65536	VAh in steps of 1 VAh

### Examples

- high Byte = 10 →  $10 * 2^{16}$  VAh = 655360 VAh  
 low byte = 100 → 100 VAh  
 ⇒ Result: 655360 VAh + 100 VAh = 655460 VAh
- high Byte = 23 →  $23 * 2^{16}$  VAh = 1507328 VAh  
 low byte = 1974 → 1974 VAh  
 ⇒ Result: 1507328 VAh + 1974 VAh = 1509302 VAh

## [3010] Internal MID Power Reverse

### Description

This register represents the sum of the power input of all three phases (Power L1 + Power L2 + Power L3) drawn from the vehicle. Only with bidirectional functionality. The power input is measured by the internal MID power meter.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
<i>not available</i>	≥ V 2.0.0	<i>not available</i>

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
<b>3010</b>	R	04 - readInputRegister	uint16	0..65536	VA in steps of 1 VA

### Examples

- 1000 → 1.000 kVA
- 9814 → 9.841 kVA
- 11000 → 11.000 kVA

### Notice

The bidirectional functionality has not yet been implemented.

## [3011 - 3012] Internal MID Energy Reverse since Installation

### Description

Electrical energy drawn from the vehicle since the wallbox was put into service. Only with bidirectional functionality. Power consumption is measured by the internal MID power meter.

The register content is not lost when the Wallbox is disconnected from the mains. A reset is not possible.

It is a 32bit number represented in two 16bit registers (see examples).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
<i>not available</i>	≥ V 2.0.0	<i>not available</i>

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Description	Range	Unit
<b>3011</b>	R	04 - readInputRegister	uint16	Energy since Installation [high byte]	0..65536	VAh in steps of 2 <sup>16</sup> VAh
<b>3012</b>	R	04 - readInputRegister	uint16	Energy since Installation [Low byte]	0..65536	VAh in steps of 1 VAh

### Examples

- high Byte = 10 → 10 \* 2<sup>16</sup> VAh = 655360 VAh  
 low byte = 100 → 100 VAh  
 ⇒ Result: 655360 VAh + 100 VAh = 655460 VAh
- high Byte = 23 → 23 \* 2<sup>16</sup> VAh = 1507328 VAh  
 low byte = 1974 → 1974 VAh  
 ⇒ Result: 1507328 VAh + 1974 VAh = 1509302 VAh

### Notice

The bidirectional functionality has not yet been implemented.

## [3100 - 3150] Internal MID Serial Number

### Description

This block of registers contains the serial number of the internal MID power meter. Each Register represents two ASCII characters. Zero byte represents the end of the mid serial number. Registers padded with 0000.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
not available	≥ V 2.0.0	not available

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range
3100	R	04 - readInputRegister	char[2]	ASCII
...	R	04 - readInputRegister	char[2]	ASCII
3150	R	04 - readInputRegister	char[2]	ASCII

### Examples

Serial number in Decimal 553914896 means serial number Hex 21041210

- Reg [3100] = 3535
- Reg [3101] = 3339
- Reg [3102] = 3134
- Reg [3103] = 3839
- Reg [3104] = 3600

Serial Number																		
5	5	3	9	1	4	8	9	6								...		
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓	↓
Reg [3100]		Reg [3101]		Reg [3102]		Reg [3103]		Reg [3104]		Reg [3105]		Reg [3106]		Reg [3108]			Reg [3150]	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓	↓
ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII	ASCII		ASCII	ASCII
35	35	33	39	31	34	38	39	39	00	00	00	00	00	00	00	00	00	

## Register Layout: Internal Power Data

### [3500 - 3502] Internal HCB Current

#### Description

These registers represent the internal HCB current rms per phase L1, L2, L3.

#### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

#### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
<b>3500</b>	R	04 - readInputRegister	uint16	L1: 0...350	Ampere rms in steps of 0.1 A
<b>3501</b>	R	04 - readInputRegister	uint16	L2: 0...350	Ampere rms in steps of 0.1 A
<b>3502</b>	R	04 - readInputRegister	uint16	L3: 0...350	Ampere rms in steps of 0.1 A

#### Examples

- 1 = 0.1 A rms
- 145 = 14.5 A rms

#### Notice

These values are for internal purposes only and should not be used for accurate billing.

## [3503 – 3505] Internal HCB Voltage

### Description

This register represents the current internal HCB voltage rms, provided by the connection point per phase.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
<b>3503</b>	R	04 - readInputRegister	uint16	$L1 - N$ 0...65536	Volt in steps of 1 V
<b>3504</b>	R	04 - readInputRegister	uint16	$L2 - N$ 0...65536	Volt in steps of 1 V
<b>3505</b>	R	04 - readInputRegister	uint16	$L3 - N$ 0...65536	Volt in steps of 1 V

### Examples

- 8 = 8 V rms
- 238 = 238 V rms
- 258 = 258 V rms

### Notice

These values are for internal purposes only and should not be used for accurate billing.



## [3506] Internal HCB Power

### Description

This register represents the sum of the internal HCB power of all three phases (Power L1 + Power L2 + Power L3) consumed by the connected vehicle.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Range	Unit
3506	R	04 - readInputRegister	uint16	0..65536	VA in steps of 1 VA

### Examples

- 1000 → 1.000 kVA
- 9814 → 9.841 kVA
- 11000 → 11.000 kVA

### Notice

These values are for internal purposes only and should not be used for accurate billing.

## [3507 – 3508] Internal HCB Energy since Power on

### Description

Internal HCB electrical energy drawn from the vehicles since the last time the Wallbox was switched on.

It is a 32bit number represented in two 16bit registers (see examples).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Description	Range	Unit
<b>3507</b>	R	04 - readInputRegister	uint16	Energy since Power On [high byte]	0..65536	VAh in steps of 2 <sup>16</sup> VAh
<b>3508</b>	R	04 - readInputRegister	uint16	Energy since Power On [low byte]	0..65536	VAh in steps of 1 VAh

### Examples

- high Byte = 1 → 1 \* 2<sup>16</sup> VAh = 65536 VAh  
 low byte = 1000 → 1000 VAh  
 ⇒ Result: 65536 VAh + 1000 VAh = 66536 VAh
- high Byte = 5 → 5 \* 2<sup>16</sup> VAh = 327680 VAh  
 low byte = 37 → 37 VAh  
 ⇒ Result: 327680 VAh + 37 VAh = 327717 VAh

### Notice

These values are for internal purposes only and should not be used for accurate billing.

## [3509 -3510] Internal HCB Energy since Installation

### Description

Internal HCB electrical energy drawn by the vehicles since commissioning of the Wallbox. The register content is not lost when the Wallbox is disconnected from the mains. A reset is not possible.

It is a 32bit number represented in two 16bit registers (see examples).

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
≥ V 2.0.0	≥ V 2.0.0	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Type	Description	Range	Unit
<b>3509</b>	R	04 - readInputRegister	uint16	Energy since Installation [high byte]	0..65536	VAh in steps of 2 <sup>16</sup> VAh
<b>3510</b>	R	04 - readInputRegister	uint16	Energy since Installation [Low byte]	0..65536	VAh in steps of 1 VAh

### Examples

- high Byte = 10 → 10 \* 2<sup>16</sup> VAh = 655360 VAh  
 low byte = 100 → 100 VAh  
 ⇒ Result: 655360 VAh + 100 VAh = 655460 VAh
- high Byte = 23 → 23 \* 2<sup>16</sup> VAh = 1507328 VAh  
 low byte = 1974 → 1974 VAh  
 ⇒ Result: 1507328 VAh + 1974 VAh = 1509302 VAh

### Notice

These values are for internal purposes only and should not be used for accurate billing.

## Register Layout: Phase Switch

### [501] Phase Switch Control

#### Description

This register allows to control the internal phase switch in the Wallbox.

#### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
<i>not available</i>	<i>not available</i>	≥ V 2.0.1

#### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Range
<b>501</b>	R/W	03 - readHoldingRegister 06 - writeHoldingRegister	1 or 3

#### Values

Value	Availability
1	Charging with 1 Phase
3	Charging with 3 Phases

#### Default Value

The default value for phase switch is 3.

## [5001] Phase Switch State

### Description

This register allows to control the internal phase switch in the Wallbox.

### Layout Version

The availability of registers depends on the layout version within the connect series.

connect.home	connect.business	connect.solar
<i>not available</i>	<i>not available</i>	≥ V 2.0.1

### Parameter

Bus-Adr.	R/W	Modbus TCP Function	Range
<b>5001</b>	R / W	04 - readInputRegister	0, 1 or 3

### Values

Value	Availability
0	phase switching in progress
1	1 phase active
3	3 phases active