

# Adlar Castra Aurora II - Modbus Register Mapping v2.2

## Volledige mapping tussen Modbus adressen en parameters

Gebaseerd op: - SolarEast OEM documentatie (ZNRB device) - R290 HBG Trading Modbus Manual - Smart Systems Jan module (customer tailored) - Tweakers Forum community feedback

**Device Info:** - **Model:** Adlar Castra Aurora II (OEM: SolarEast BLN-006TB1) - **Tuya Device ID:** ZNRB - **Refrigerant:** R32 (P119 must = 2) - **Protocol:** Modbus RTU/TCP - **Slave Address:** Configureerbaar via P45 (default: 1)

## 1. Sensor Registers (Read-Only)

**Functie:** 03H (Read Holding Registers)

Adres	Register	Unit	Scale	Bereik	Beschrijving
0x0040	Compressor Running Frequency	Hz	×1	-	compressorRunningFreq
0x0041	Fan Running Speed	RPM	×1	-	fanRunningSpeed
0x0042	EEV Open Step	P	×1	-	eevOpenStep
0x0043	EVI Valve Open Step	P	×1	-	eviValveOpenStep
0x0044	AC Input Voltage	V	×1	-	acInputVoltage
0x0045	AC Input Current	A	÷10	-	acInputCurrent
0x0046	Compressor Phase Current	A	÷10	-	compressorPhaseCurrent
0x0047	Compressor IPM Temp	°C	÷10	-	compressorIpmpTemp
0x0048	High Pressure Saturation Temp	°C	÷10	-	highPressureSatTemp
0x0049	Low Pressure Saturation Temp	°C	÷10	-	lowPressureSatTemp
0x004A	Ambient Temp (T1)	°C	÷10	-	ambientTempT1
0x004B	Outer Coil Temp (T2)	°C	÷10	-	outerCoilTempT2
0x004C	Inner Coil Temp (T3)	°C	÷10	-	innerCoilTempT3
0x004D	Suction Temp (T4)	°C	÷10	-	suctionTempT4
0x004E	Exhaust Temp (T5)	°C	÷10	-	exhaustTempT5
0x004F	Water Inlet Temp (T6)	°C	÷10	-	waterInletTempT6
0x0050	Water Outlet Temp (T7)	°C	÷10	-	waterOutletTempT7
0x0051	Economizer Inlet Temp (T8)	°C	÷10	-	economizerInletT8
0x0052	Economizer Outlet Temp (T9)	°C	÷10	-	economizerOutletT9
0x0053	Device Tooling No		×1	-	deviceToolingNo
0x0054	DHW Tank Temperature	°C	÷10	-	waterTankTemp
0x0055	Plate HX Exhaust Temp	°C	÷10	-	plateHxExhaustTemp
0x0056	Drive Manufacturer Code		×1	-	driveManufacturer
0x0057	Water Pump Speed PWM	%	×1	-	waterPumpSpeedPWM
0x0058	Water Flow	L/min	×1	-	waterFlow
0x0059	DHW Return Water Temp	°C	÷10	-	dhwReturnWaterTemp
0x005A	Unit Input Voltage	V	×1	-	deviceInputVoltage
0x005B	Unit Input Current	A	÷100	-	deviceInputCurrent
0x005C	Unit Input Power	kW	÷100	-	deviceInputPower
0x005D	Total Energy Consumption	kWh	×1	-	totalEnergyConsumption
0x0072	Solar Water Heater Temp	°C	÷10	-	solarWaterHeaterTemp
0x0073	Zone 2 Temp	°C	÷10	-	zone2Temp
0x0074	Buffer Tank Temp	°C	÷10	-	bufferTankTemp

0x0075	Total Water Outlet Temp		°C	+10	-	totalWaterOutletTemp
0x0076	B Phase Input Voltage		V	×1	-	bPhaseVoltage
0x0077	B Phase Input Current		A	÷100	-	bPhaseCurrent
0x0078	C Phase Input Voltage		V	×1	-	cPhaseVoltage
0x0079	C Phase Input Current		A	÷100	-	cPhaseCurrent
0x007A	Smart Grid Status			×1	-	smartGridStatus
0x007B	Zone 2 Mixing Valve Opening	%	×1	-	-	zone2MixingValve
0x007C	Zone 1 Mixing Temp	°C	+10	-	-	zone1MixingTemp
0x007D	Zone 1 Mixing Valve Opening	%	×1	-	-	zone1MixingValve
0x00FA	Heating Temp Upper Limit	°C	+10	-	-	heatingTempUpperLimit
0x00FB	Heating Temp Lower Limit	°C	+10	-	-	heatingTempLowerLimit
0x00FC	Hot Water Temp Upper Limit	°C	+10	-	-	hotWaterTempUpperLimit
0x00FD	Hot Water Temp Lower Limit	°C	+10	-	-	hotWaterTempLowerLimit
0x00FE	Cooling Temp Upper Limit	°C	+10	-	-	coolingTempUpperLimit
0x00FF	Cooling Temp Lower Limit	°C	+10	-	-	coolingTempLowerLimit
0x0306	Indoor Temperature Set Point	°C	+10	-	-	indoorTempSetpoint
0x0317	Zone 2 Temperature	°C	+10	-	-	zone2Temp
0x0319	Zone 1 Temperature	°C	+10	-	-	zone1Temp

## 2. Control Registers (Read/Write)

Functie: 06H (Write Single Register) of 05H (Write Coil voor commands)

Adres	Register	Unit	Scale	Waarden	Beschrijving
0x0300	Cooling Set Temperature	°C	+10	5-40°C	Koeling setpoint
0x0301	Heating Set Temperature	°C	+10	15-80°C	Verwarming setpoint
0x0302	Hot Water Set Temperature	°C	÷10	30-80°C	Tapwater setpoint
0x0303	Floor Heating Set Temperature	°C	+10	15-55°C	Vloerverwarming setpoint
0x0304	Set Mode	-	1	0-7	0=Cooling, 1=Heating, 2=Hot Water, 3=Floor Heating, 4=Hot Water+Cooling, 5=Hot Water+Heating, 6=Reserve, 7=Hot Water+Floor Heating
0x0305	On/Off	-	1	0/1	0=OFF, 1=ON
0x0306	Indoor Temp Set Point	°C	+10	-	Kamertemperatuur setpoint
0x0307	User Function Mode	-	1	0-2	0=Standard, 1=Powerful, 2=Silent
0x0313	Cooling Curve Setting	-	1	1-18	Koelcurve selectie (protocol ≥130)
0x0314	Heating Curve Setting	-	1	1-18	Stooklijn selectie (protocol ≥130)
0x0315	Hot Water Curve Setting	-	1	1-18	Tapwater curve (protocol ≥130)
0x0316	Floor Heating Curve Setting	-	1	1-18	Vloer curve (protocol ≥130)

## 3. Parameter Registers (P00-P261)

Functie: 06H (Write Single Register)

### 3.1 Protection & Safety

Param	Adres	Min	Max	Default	Unit	Beschrijving
P00	0x0100	0	1	0	-	T1 Ambient temp sensor. 0=enable, 1=disable
P01	0x0101	0	1	0	-	High voltage switch. 0=enable, 1=disable
P02	0x0102	0	1	0	-	Low pressure switch. 0=enable, 1=disable
P03	0x0103	0	1	1	-	Water flow switch. 0=enable, 1=disable. NB: R290 doc zegt range 1~2, Adlar R32 i

<b>P04</b>	0x0104	0	1	0	-	Thermal overload protection. 0=enable, 1=disable
<b>P05</b>	0x0105	0	3	0	-	Linkage switch (host). 0=enable, 1=disable, 2=thermostatic, 3=heating thermostat
<b>P06</b>	0x0106	0	2	1	-	Fan type. 0=AC, 1=DC, 2=EC
<b>P07</b>	0x0107	0	1	0	-	High voltage lock. 0=3 locks, 1=no lock
<b>P08</b>	0x0108	0	1	0	-	Low voltage lock. 0=3 locks, 1=no lock
<b>P09</b>	0x0109	0	1	0	-	Exhaust lock. 0=3 locks, 1=no lock
<b>P10</b>	0x010A	0	1	0	-	Water flow lock. 0=3 locks, 1=no lock

### 3.2 Protection Values

Param	Adres	Min	Max	Default	Unit	Beschrijving
<b>P11</b>	0x010B	40	150	-	°C	High pressure protection value
<b>P12</b>	0x010C	40	150	-	°C	High pressure freq limit. Must be ≤ P11-5
<b>P15</b>	0x010F	100	130	-	°C	Exhaust temp protection
<b>P16</b>	0x0110	90	120	-	°C	Exhaust temp freq limit. Must be ≤ P15-10

### 3.4 Temperature Compensation

Param	Adres	Min	Max	Default	Unit	Beschrijving
<b>P23</b>	0x0117	10	30	20	°C	Excessive temp diff alarm
<b>P24</b>	0x0118	-10	10	0	°C	Return water compensation. Sensor offset correctie. Adlar Aurora II: T6 (return/
<b>P25</b>	0x0119	-10	10	0	°C	Outlet water compensation. Sensor offset correctie. Adlar Aurora II: T7 (outlet/
<b>P26</b>	0x011A	0	10	5	°C	H&C return differential value
<b>P27</b>	0x011B	0	10	5	°C	Floor heating return differential value
<b>P29</b>	0x011D	0	10	2	min	Antifreeze pump running time

### 3.6 Defrost Control

Param	Adres	Min	Max	Default	Unit	Beschrijving
<b>P30</b>	0x011E	0	3	0	-	Defrost mode. 0=smart, 1=timing, 2=fast, 3=dew point
<b>P31</b>	0x011F	0	120	45	-	Defrost accumulated threshold
<b>P32</b>	0x0120	-30	0	-5	°C	Defrost entry coil temp
<b>P33</b>	0x0121	0	20	9	°C	Defrost entry temp diff 1
<b>P34</b>	0x0122	0	20	7	°C	Defrost entry temp diff 2
<b>P35</b>	0x0123	0	30	10	min	Max defrost time
<b>P36</b>	0x0124	0	30	12	°C	Defrost exit coil temp
<b>P174</b>	0x01AE	0	480	450	P	Defrost valve opening
<b>P181</b>	0x01B5	0	2	0	-	Defrost selection - evaporate side. 0=current mode, 1=heating, 2=DHW

### 3.7 Sensor Settings

Param	Adres	Min	Max	Default	Unit	Beschrijving
<b>P39</b>	0x0127	0	1	0	-	Pressure sensor settings. 0=enable, 1=disable
<b>P43</b>	0x012B	0	1	0	-	MV switch setting. 0=disable, 1=enable
<b>P44</b>	0x012C	0	1	0	-	Water flow switch failure detect. 0=enable, 1=disable
<b>P45</b>	0x012D	1	16	1	-	Modbus slave address
<b>P48</b>	0x0130	0	1	0	-	Enable DHW tank temp sensor. 0=disable, 1=enable

### 3.8 Frequency Control - Cooling

Param	Adres	Min	Max	Default	Unit	Beschrijving
P50	0x0132	-100	100	-	-	Cooling target freq constant A
P51	0x0133	15	60	-	Hz	Cooling min freq
P52	0x0134	40	120	-	Hz	Cooling target freq upper
P53	0x0135	15	120	-	Hz	Cooling target freq lower. Must be ≤ P52

### 3.9 Frequency Control - Heating

Param	Adres	Min	Max	Default	Unit	Beschrijving
P54	0x0136	-100	100	-	-	Heating target freq constant B
P55	0x0137	50	120	-	Hz	Heating target freq upper
P56	0x0138	20	120	-	Hz	Heating target freq lower
P57	0x0139	15	60	-	Hz	Heating min freq (ambient > 0°C). ☀ COP: lagere waarde = beter COP bij mild
P58	0x013A	15	60	-	Hz	Heating min freq (-10°C ≤ ambient < 0°C)
P59	0x013B	15	60	-	Hz	Heating min freq (ambient < -10°C)

### 3.10 Frequency Control - Hot Water

Param	Adres	Min	Max	Default	Unit	Beschrijving
P60	0x013C	-100	100	-	-	Hot water target freq constant
P61	0x013D	50	120	-	Hz	Hot water target freq upper
P62	0x013E	15	120	-	Hz	Hot water target freq lower. Must be ≤ P61
P63	0x013F	15	60	-	Hz	Hot water min freq (ambient > 0°C). ☀ COP: lagere waarde = beter COP bij mil
P64	0x0140	15	60	-	Hz	Hot water min freq (-10°C ≤ ambient < 0°C)
P65	0x0141	15	60	-	Hz	Hot water min freq (ambient < -10°C)

### 3.3 Fan Control

Param	Adres	Min	Max	Default	Unit	Beschrijving
P17	0x0111	0	60	-	°C	Cooling fan speed-up value
P18	0x0112	0	60	-	°C	Cooling fan speed-down value
P19	0x0113	0	60	-	°C	Heating fan speed-down value
P20	0x0114	0	60	-	°C	Heating fan speed-up value
P66	0x0142	20	60	-	Hz	DC fan initial freq. RPM = freq × 15. Range 300–900 RPM
P67	0x0143	20	60	-	Hz	DC fan heating min freq
P68	0x0144	20	80	-	Hz	DC fan heating max freq
P69	0x0145	20	60	-	Hz	DC fan cooling min freq
P70	0x0146	20	80	-	Hz	DC fan cooling max freq

### 3.11 Quiet Mode

Param	Adres	Min	Max	Default	Unit	Beschrijving
P88	0x0158	20	70	-	Hz	Silent mode compressor freq
P89	0x0159	20	60	-	Hz	Silent mode fan freq

### 3.5 Pump Control

Param	Adres	Min	Max	Default	Unit	Beschrijving

<b>P28</b>	0x011C	0	4	0	-	Pump mode at shutdown. 0=keep running, 1=stop, 2=cooling only, 3=AC/heating only
<b>P95</b>	0x015F	0	1	-	-	Network pump mode. 0=shared, 1=independent
<b>P99</b>	0x0163	2	10	5	°C	Pump speed regulation temp diff
<b>P100</b>	0x0164	20	80	-	%	PWM pump minimum speed
<b>P101</b>	0x0165	0	1	-	-	Pump control mode. 0=AC(on/off), 1=DC(PWM)
<b>P146</b>	0x0192	0	100	-	L/min	Pump PWM range setting
<b>P150</b>	0x0196	0	3	2	-	Secondary heating pump select. 0=power on run, 1=power on, 2=linkage demand swit
<b>P161</b>	0x01A1	0	4	0	-	Aux pump selection. 0=DHW, 1=AC, 2=floor, 3=AC/floor, 4=all
<b>P162</b>	0x01A2	0	360	90	min	Antifreeze DHW pipe interval. 0=disabled
<b>P163</b>	0x01A3	0	70	-	%	Min pump speed feedback. âšj FIX v2.0: OEM doc zegt L/min, Excel zegt %. Range 0
<b>P260</b>	0x0204	50	99	-	%	Max DC pump speed
<b>P261</b>	0x0205	20	99	-	%	DC pump constant temp speed

### 3.13 Temperature Limits

Param	Adres	Min	Max	Default	Unit	Beschrijving
<b>P105</b>	0x0169	10	60	-	°C	Cooling ambient temp limit
<b>P106</b>	0x016A	10	60	-	°C	Heating ambient temp limit
<b>P107</b>	0x016B	10	60	-	°C	Hot water ambient temp limit
<b>P108</b>	0x016C	30	80	-	°C	Hot water set temp upper
<b>P109</b>	0x016D	10	30	-	°C	Hot water set temp lowest
<b>P110</b>	0x016E	30	80	-	°C	Heating set temp upper
<b>P111</b>	0x016F	15	30	-	°C	Heating set temp lowest
<b>P112</b>	0x0170	20	40	-	°C	Cooling set temp upper
<b>P113</b>	0x0171	5	20	-	°C	Cooling set temp lowest

### 3.14 System Configuration

Param	Adres	Min	Max	Default	Unit	Beschrijving
<b>P114</b>	0x0172	1	2	-	-	Nr of compressors. 1=single, 2=pair
<b>P115</b>	0x0173	0	5	-	-	Model selection. 0=double supply, 1=triple, ...
<b>P116</b>	0x0174	0	1	0	-	Temp control mode. Adlar Aurora II: 0=inlet T6 (return water), 1=outlet T7 (disc
<b>P119</b>	0x0177	1	3	-	-	Refrigerant type. 1=R410A, 2=R32 (Adlar Aurora II), 3=R290. Valideatie: moet 2 zi
<b>P120</b>	0x0178	0	1	0	-	Anti-condensation function. 0=enable, 1=disable

### 3.15 Anti-freeze

Param	Adres	Min	Max	Default	Unit	Beschrijving
<b>P117</b>	0x0175	0	10	5	°C	Antifreeze ambient temp
<b>P118</b>	0x0176	0	20	3	°C	Antifreeze outlet water

### 3.16 Electric Heating

Param	Adres	Min	Max	Default	Unit	Beschrijving
<b>P139</b>	0x018B	0	2	0	-	Buffer tank electric heater. 0=enable, 1=disable, 2=AHS (Auxiliary Heat Source)
<b>P140</b>	0x018C	0	2	0	-	DHW electric heater. 0=enable, 1=disable, 2=AHS
<b>P182</b>	0x01B6	0	3	-	-	Pipe electric heating option. 0=3kW+6kW, 1=3kW, 2=6kW, 3=disabled

### 3.17 Water Flow

Param	Adres	Min	Max	Default	Unit	Beschrijving
P134	0x0186	0	100	-	L/min	Low water flow protection. 0=disabled

### 3.19 Smart Grid

Param	Adres	Min	Max	Default	Unit	Beschrijving
P254	0x01FE	0	1	0	-	Heating medium. 0=water, 1=antifreeze liquid
P255	0x01FF	0	1	-	-	Smart Grid enable. 0=enable, 1=disable (inverse logical)
P256	0x0200	30	999	-	min	Peak grid runtime

### 3.18 Misc

Param	Adres	Min	Max	Default	Unit	Beschrijving
P103	0x0167	0	10	-	min	Mode switch min run time. 0=unlimited
P151	0x0197	0	40	0	°C	Return diff - hot water heat source
P152	0x0198	0	40	0	°C	Return diff - heating heat source

### 3.12 Overige

Param	Adres	Min	Max	Default	Unit	Beschrijving
P49	0x0131	30	100	30	%	Hot water freq running percentage
P96	0x0160	0	10	5	°C	DHW differential value
P164	0x01A4	0	3	-	-	Energy level control. 0=all enable, 1=E-heat disable, 2=compressor disable, 3=al

## 4. L-Parameter Registers (L11-L36)

**Lokale parameters** voor geavanceerde functies.

Param	Adres	Min	Max	Default	Unit	Beschrijving
L11	0x0800	1	300	-	min	Pipe electricity heating cycle
L12	0x0801	0	2	0	-	Sterilization mode. 0=auto, 1=off, 2>manual
L13	0x0802	5	30	7	days	Days between sterilizations
L14	0x0803	-	-	2300	-	Sterilization start time. Format: HHMM (bijv. 2300 = 23:00). Default: 23:00
L15	0x0804	0	50	10	min	Sterilization run time
L16	0x0805	50	80	70	°C	Sterilization temperature
L17	0x0806	0	2	-	-	Water level control. 0=Off, 1=Hi/Lo switch, 2=Hi/Hi/Lo switch
L18	0x0807	0	1	-	-	Hydration control. 0=level only, 1=temp + level
L19	0x0808	0	99	45	°C	Allow water temperature
L20	0x0809	0	20	5	°C	Hysteresis replenishment water
L21	0x080A	0	2	-	-	Low water cut-off operation. 0=no start, 1=on but no start, 2=start
L22	0x080B	0	3	0	-	DHW return water setting. 0=disable, 1=continuous return, 2=cycle return, 3=temperature diff return
L23	0x080C	20	65	40	°C	Return water temp setting
L24	0x080D	1	15	5	°C	Return water temp differential
L25	0x080E	3	90	30	min	Return water interval period
L26	0x080F	1	30	5	min	Return water running period
L27	0x0810	0	1	0	-	Heating low temp curve DIY. 0=enable DIY curve, 1=disable. Wanneer enabled, gebruikt L28/L29 i.p.v.
L28	0x0811	-50	0	-	-	Heating low temp curve coefficient k. Negatief: dalende lijn. Tset = k × (Tamb + 15) + b. Bijv. k=-

L29	0x0812	30	80	-	-	Heating low temp curve constant b. Y-intercept van de stooklijn. Bijv. b=52.5 voor typische VT insta
L30	0x0813	0	1	0	-	Heating capacity statistics. 0=enable, 1=disable. Schakelt interne energieboekhouding in.
L31	0x0814	0	999	-	L/min	External pump flow rate. Vaste waarde als er geen flowmeter is. Gebruikt voor COP berekening.
L32	0x0815	0	9999	-	W	DHW electric heater power
L33	0x0816	0	9999	-	W	Pipe electric heater 1 power
L34	0x0817	0	9999	-	W	Pipe electric heater 2 power
L35	0x0818	0	9999	-	W	Heating electric heater power
L36	0x0819	0	9999	-	W	External water pump power

## 5. Coil Addresses (Commands)

Functie: 05H (Write Single Coil) - alleen bij protocol versie  $\geq 130$

Adres	Coil	Functie	Beschrijving
0x1000	0	Powerful Mode	Forceer hoog vermogen
0x1001	1	Silent Mode	Stil bedrijf
0x1012	18	Quick Heat Mode	Snelle opwarming
0x1013	19	Force Defrost	Forceer ontdooen
0x1014	20	System Drain Mode	Systeem legen
0x1015	21	Refrigerant Recovery	Koudemiddel terugwinning
0x1018	24	Force Sterilization	Forceer sterilisatie
0x101A	26	Allow Water Return	Sta water retour toe
0x101D	29	Restore Factory Settings	Reset naar fabrieksinstellingen

## 6. Version Info Registers

System informatie - alleen beschikbaar bij protocol  $\geq 130$

Adres	Register	Waarden	Beschrijving
0x0360	Software Version	100 = v1.0.0	Firmware versie
0x0361	Product Type	0/1/2	0=Commercial inverter, 1=Domestic ON/OFF, 2=Commercial ON/OFF
0x0362	Product Type ID	-	Sub-type identificatie
0x0363	Protocol Version	$\geq 130$	130+ = coil support + separate curves

## Belangrijke Opmerkingen

### • v2.2 Scaling Fixes

Temperaturen (ALLE): - Multiply: 0.1 → raw waarde  $\div 10 = {}^{\circ}\text{C}$  - Voorbeeld: raw = 255 → 25.5°C - Geldt voor: T1-T9, setpoints, limieten

Vermogen/Stroom: - 0x005C Unit Power: multiply 0.01 → raw  $\div 100 = \text{kW}$  - 0x005B Unit Current: multiply 0.01 → raw  $\div 100 = \text{A}$  - 0x0077 / 0x0079 Phase Current: multiply 0.01 → raw  $\div 100 = \text{A}$

### • Coil Commands

1. Lees eerst 0x0363 (Protocol Version)
2. Als versie  $\geq 130$ : coil commands beschikbaar
3. Gebruik Modbus functie 05H (Write Single Coil)
4. NIET 06H (Write Single Register)

### • Native DIY Stooklijn

Registers: - L27 (0x0810): Mode → 0 = enable DIY, 1 = disable - L28 (0x0811): Slope k (opgeslagen  $\times -10$ ) - L29 (0x0812): Intercept b (opgeslagen  $\times 10$ )

Formule:

```
T_setpoint = k × (T_ambient + 15) + b
```

**Voorbeeld:** RC = -1.5, setpoint 45°C bij -10°C ambient

k = -1.5 → L28 = -15  
b = 52.5 → L29 = 525  
L27 = 0 (enable)

### ❖ COP Optimalisatie

**Frequentie Control** (P57-P59): - Lagere min freq bij hogere ambient = beter COP - P57: ambient > 0°C - P58: -7°C < ambient ≤ 0°C - P59: ambient ≤ -7°C

**Energieboekhouding** (L30-L36): - L30: Enable statistieken - L31: Flow rate (voor COP calc) - L32-L36: Power ratings - **Waarschuwing:** DPS power vaak 0 → gebruik externe meter!

### ✓ Validatie & Controles

1. **Refrigerant:** P119 = 2 (R32)
2. **Temp Control:** P116 = 0 (inlet T6) voor Adlar
3. **Protocol Version:** Lees 0x0363 voor feature check
4. **Slave Address:** P45 (default: 1)