

## S-TOUCH settings

SOLANO system can be controlled via Building Management System (referred to as BMS) using S-TOUCH as a gate to access all available SOLANO devices. There are two different BMS work modes. The option to change BMS work mode is located in Holding Registers under address 0x04.

Holding registers: includes changeable (**if not stated otherwise**) registers.

Input registers: includes non - changeable registers.

Protocol parameters

1 Standard	RS485
2 Baudrate	9600, 19200, 38400, 57600, 76800, 115200, 230400
3 Data bits	8
4 Parity	Even
5 Stop Bits	1
6 Version	ModBus RTU

## BMS Single driver mode.

Direct access to S-ECM settings. S-TOUCH settings are blocked (it's not possible to manually change system options). All the settings can be changed via BMS for every driver. For example change of antifreeze settings in holding registers (0x07) do not change this setting in other connected drivers to given S-TOUCH.

## How to extract and change single driver registers?

BMS Work parameter has to be set to 0x01. Driver holding and input registers are shifted depending on the address set by the user on S-ECM PCB. The information about the shift can be found in a sub-chapter called Input Registers. Example:

- S-ECM with address 0x04
- check S-ECM04GroupId register and it's value (can be found in a sub-chapter called Input Registers) it should be equal to 0x03 (S-ECM)

0x14	S-ECM04GroupId	Single S-ECM identifier.		
		Modbus address 0x04.		
		Address space	First address	Last address
		Input registers	0x01C0	0x01FF
		Holding registers	0x01C0	0x01FF

- first address column contains the information about the starting location of registers used to control driver with address 04
- to calculate shifted address chose a register from S-ECM documentation and add it to first address e.g.
  - S-ECM Holding Registers Address 0x04 (WorkMode)
  - First address 0x01C0 (Group 4)
  - S-ECM Holding Register Address via BMS S-TOUCH gate  $0x04 + 0x01C0 = 0x01C4$

## BMS Group mode.

Indirect access to S-ECM settings via groups. S-TOUCH settings are unblocked and can be freely modified by BMS. Group is a compilation of the same products connected to S-TOUCH (Air curtains, Fan heaters, destratifiers). Every change in (for example) Air Curtains group will modify settings for all Air Curtians connected to single S-TOUCH.

Single driver (S-ECM PCB) settings are read only.

## How to extract and change group registers?

BMS Work parameter has to be set to 0x02. Driver (S-ECM PCB) holding and input registers are shifted depending on the group. There can be maximum eight groups (One group 'NON' is control: empty), to identify which driver is assigned to which group read adequate register address.

Example:

- S-ECM with address 0x04, S-ECM with address 0x0A
- check the group identifiers (can be found in a sub-chapter called Input Registers 0x41 - 0x48), S-ECM group is identified by value 0x03
- for the sake of the example let's assume Input Register 0x42 equals 0x03

0x42	Group02Id	Second S-ECM PCB group identifier.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Holding registers	0x1100	0x11FF

- first address column contains the information about the starting location of registers used to control the second group of drivers
- to calculate shifted address chose a register from Group S-ECM documentation and add it to first address e.g.
  - GroupSolano Holding Registers Address 0x04 (WorkMode)
  - First address 0x1100 (Second S-ECM group)
  - GroupSolano Holding Address via BMS S-TOUCH gate  $0x04+0x1100 = 0x1104$

## S-TOUCH - Holding registers

Address	Name	Description									
0x00	Rsv	Reserved.									
0x01	SoftType	<p>Enables software setup.</p> <p>Information about program type and it's version. Description is split between &lt;MSB&gt; &lt;LSB&gt;.</p> <p>&lt;MSB&gt; software version</p> <p>0x00 – S-TOUCH</p> <p>&lt;LSB&gt; software programming options (implemented for future use).</p> <table border="1"> <thead> <tr> <th>&lt;LSB&gt;</th> <th>Option name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0x02</td> <td>MAIN</td> <td>Main software version</td> </tr> </tbody> </table>	<LSB>	Option name	Description	0x02	MAIN	Main software version			
<LSB>	Option name	Description									
0x02	MAIN	Main software version									
0x02	Rsv	Reserved.									
0x03	Rsv	Reserved.									
0x04	BmsMode	<p>BMS work mode.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0x0001</td> <td>BMS_WM_RAW</td> <td>Direct access to S-ECM settings. S-TOUCH settings blocked.</td> </tr> <tr> <td>0x0002</td> <td>BMS_WM_GROUP</td> <td>Indirect access to S-ECM settings via groups. S-TOUCH settings unblocked.</td> </tr> </tbody> </table>	Value	Name	Description	0x0001	BMS_WM_RAW	Direct access to S-ECM settings. S-TOUCH settings blocked.	0x0002	BMS_WM_GROUP	Indirect access to S-ECM settings via groups. S-TOUCH settings unblocked.
Value	Name	Description									
0x0001	BMS_WM_RAW	Direct access to S-ECM settings. S-TOUCH settings blocked.									
0x0002	BMS_WM_GROUP	Indirect access to S-ECM settings via groups. S-TOUCH settings unblocked.									

0x05	Enable	<p>Enables/disables S-TOUCH and S-ECM.</p> <ul style="list-style-type: none"> <li>• 0 - disable</li> <li>• 1..65535 - enable</li> </ul>									
0x06	Tref	<p>Target reference temperature for all drivers.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>5,0</td> <td>Minimal value</td> </tr> <tr> <td>450</td> <td>45,0</td> <td>Maximal value</td> </tr> </tbody> </table>	Value	Temperature	Description	50	5,0	Minimal value	450	45,0	Maximal value
Value	Temperature	Description									
50	5,0	Minimal value									
450	45,0	Maximal value									
0x07	AntifreezeWareHouseEnable	<p>Enables/disables warehouse antifreeze mode.</p> <ul style="list-style-type: none"> <li>• 0 - disable</li> <li>• 1..65535 - enable</li> </ul>									
0x08	AntifreezeWareHouseTempRef	<p>Target temperature to enable warehouse antifreeze.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>5,0</td> <td>Minimal value</td> </tr> <tr> <td>150</td> <td>15,0</td> <td>Maximal value</td> </tr> </tbody> </table>	Value	Temperature	Description	50	5,0	Minimal value	150	15,0	Maximal value
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0x09	TleadSensorSelect	<p>Leading sensor selection.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TSL_TLEAD</td> <td>S-TOUCH leading sensor temperature.</td> </tr> <tr> <td>3</td> <td>TSL_T4</td> <td>S-ECM sensor temperature (T4 connector)</td> </tr> </tbody> </table>	Value	Name	Description	1	TSL_TLEAD	S-TOUCH leading sensor temperature.	3	TSL_T4	S-ECM sensor temperature (T4 connector)
Value	Name	Description									
1	TSL_TLEAD	S-TOUCH leading sensor temperature.									
3	TSL_T4	S-ECM sensor temperature (T4 connector)									
0x0A	Tsl_Tlead_Offset	<p>S-TOUCH temperature sensor offset.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>-100</td> <td>-10,0</td> <td>Minimal value</td> </tr> <tr> <td>100</td> <td>10,0</td> <td>Maximal value</td> </tr> </tbody> </table>	Value	Temperature	Description	-100	-10,0	Minimal value	100	10,0	Maximal value
Value	Temperature	Description									
-100	-10,0	Minimal value									
100	10,0	Maximal value									

0x0B	Tsl_T4_Offset	<p>S-ECM temperature sensor offset (regards all T4 sensors).</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>-100</td> <td>-10,0</td> <td>Minimal value</td> </tr> <tr> <td>100</td> <td>10,0</td> <td>Maximal value</td> </tr> </tbody> </table>	Value	Temperature	Description	-100	-10,0	Minimal value	100	10,0	Maximal value
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-100	-10,0	Minimal value									
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0x0E	DateYear	<p>Set year.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>2014</td> <td>Minimal value</td> </tr> <tr> <td>2100</td> <td>Maximal value</td> </tr> </tbody> </table>	Value	Description	2014	Minimal value	2100	Maximal value			
Value	Description										
2014	Minimal value										
2100	Maximal value										
0x0F	DateMonth	<p>Set month.</p> <p>Range from 1 to 12.</p>									
0x10	DateDay	<p>Set day.</p> <p>Range from 1 to 31.</p>									
0x11	DateHours	<p>Set hour.</p> <p>Range from 0 to 23.</p>									
0x12	DateMinutes	<p>Set minute.</p> <p>Range from 0 to 59.</p>									
0x13	DateSeconds	<p>Set second.</p> <p>Range from 0 to 59.</p>									

## S-TOUCH - Input registers

Address	Name	Description						
0x00	HardwareType	<p>Information about hardware type and it's version.</p> <p>Description is split between &lt;MSB&gt; &lt;LSB&gt;.</p> <p>&lt;MSB&gt; PCB name.</p> <p>0x00 – S-TOUCH</p> <p>&lt;LSB&gt; PCB version.</p> <p>PCB version is described by BCD code. e.g. for 1.0 version &lt;LSB&gt; = 0x10.</p>						
0x01	SoftType	<p>Information about software type.</p> <p>Information about program type and it's version. Description is split between &lt;MSB&gt; &lt;LSB&gt;.</p> <p>&lt;MSB&gt; software version</p> <p>0x00 – S-TOUCH</p> <p>&lt;LSB&gt; software programming options (implemented for future use)</p> <table border="1" data-bbox="500 1381 1008 1549"> <thead> <tr> <th>&lt;LSB&gt;</th> <th>Option name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0x02</td> <td>MAIN</td> <td>Main program version</td> </tr> </tbody> </table>	<LSB>	Option name	Description	0x02	MAIN	Main program version
<LSB>	Option name	Description						
0x02	MAIN	Main program version						
0x02	ConnectionCnt	<p>Connection count. Increased each time register is read. First query always returns value 0x01. If registry value equals 0xFFFF before the query next one will be equal to 0x00. Monitoring this register enables system diagnostics (e.g. if the program was not deployed second time after voltage shortage).</p>						

0x03	SoftVer	Software version.		
		<b>Bits</b>	<b>Range</b>	<b>Description</b>
		0-3	0x1 / 0xF	TAG
		4-7	0x0 / 0xF	MINOR
		8-11	0x0 / 0xF	MAJOR
12-15	0x00	Reserved		
0x05	TempTBox	Temperature measured by build-in S-TOUCH sensor.		
0x06	TempT4Ave	Mean temperature measured by all T4 sensors connected to S-ECM.		
		<b>Value</b>	<b>Temperature</b>	<b>Description</b>
		-350	35,0	Minimal value
		350	35,0	Maximal value
		0x7000	-	Short circuit
0x7FFF	-	PT1000 sensor not connected		
0x10	S-ECMCount	S-ECM count connected to S-TOUCH. Range from 0 to 31		

0x11	S-ECM01GroupId	Single S-ECM identifier.		
		Modbus address 0x01.		
		<b>Value</b>	<b>Name</b>	<b>Description</b>
		0	Non	No S-ECM connected
		3	GroupSOLANO	S-ECM - SOLANO
		4	GroupSOLANO COMBI	S-ECM – SOLANO COMBI
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0100	0x013F
0x12	S-ECM02GroupId	Single S-ECM identifier.		
Modbus address 0x02.				
<b>Address space</b>	<b>First address</b>	<b>Last address</b>		
Input registers	0x0140	0x017F		
Holding registers	0x0140	0x017F		
0x13	S-ECM03GroupId	Single S-ECM identifier.		
Modbus address 0x03.				
<b>Address space</b>	<b>First address</b>	<b>Last address</b>		
Input registers	0x0180	0x01BF		
Holding registers	0x0180	0x01BF		



0x14	S-ECM04GroupId	Single S-ECM identifier.		
		Modbus address 0x04.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x01C0	0x01FF
		0x01C0	0x01FF	
0x15	S-ECM05GroupId	Single S-ECM identifier.		
		Modbus address 0x05.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0200	0x023F
		0x0200	0x023F	
0x16	S-ECM06GroupId	Single S-ECM identifier.		
		Modbus address 0x06.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0240	0x027F
		0x0240	0x027F	
0x17	S-ECM07GroupId	Single S-ECM identifier.		
		Modbus address 0x07.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0280	0x02BF
		0x0280	0x02BF	

0x18	S-ECM08GroupId	Single S-ECM identifier.		
		Modbus address 0x08.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x02C0	0x02FF
		0x02C0	0x02FF	
0x19	S-ECM09GroupId	Single S-ECM identifier.		
		Modbus address 0x09.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0300	0x033F
		0x0300	0x033F	
0x1A	S-ECM10GroupId	Single S-ECM identifier.		
		Modbus address 0x0A.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0340	0x037F
		0x0340	0x037F	
0x1B	S-ECM11GroupId	Single S-ECM identifier.		
		Modbus address 0x0B.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0380	0x03BF
		0x0380	0x03BF	

0x1C	S-ECM12GroupId	Single S-ECM identifier.		
		Modbus address 0x0C.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x03C0	0x03FF
		0x03C0	0x03FF	
0x1D	S-ECM13GroupId	Single S-ECM identifier.		
		Modbus address 0x0D.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0400	0x043F
		0x0400	0x043F	
0x1E	S-ECM14GroupId	Single S-ECM identifier.		
		Modbus address 0x0E.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0440	0x047F
		0x0440	0x047F	
0x1F	S-ECM15GroupId	Single S-ECM identifier.		
		Modbus address 0x0F.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0480	0x04BF
		0x0480	0x04BF	

0x20	S-ECM16GroupId	Single S-ECM identifier.		
		Modbus address 0x10.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x04C0	0x04FF
		0x04C0	0x04FF	
0x21	S-ECM17GroupId	Single S-ECM identifier.		
		Modbus address 0x11.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0500	0x053F
		0x0500	0x053F	
0x22	S-ECM18GroupId	Single S-ECM identifier.		
		Modbus address 0x12.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0540	0x057F
		0x0540	0x057F	
0x23	S-ECM19GroupId	Single S-ECM identifier.		
		Modbus address 0x13.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0580	0x05BF
		0x0580	0x05BF	

0x24	S-ECM20GroupId	Single S-ECM identifier.		
		Modbus address 0x14.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x05C0	0x05FF
		0x05C0	0x05FF	
0x25	S-ECM21GroupId	Single S-ECM identifier.		
		Modbus address 0x15.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0600	0x063F
		0x0600	0x063F	
0x26	S-ECM22GroupId	Single S-ECM identifier.		
		Modbus address 0x16.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0640	0x067F
		0x0640	0x067F	
0x27	S-ECM23GroupId	Single S-ECM identifier.		
		Modbus address 0x17.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0680	0x06BF
		0x0680	0x06BF	

0x28	S-ECM24GroupId	Single S-ECM identifier.		
		Modbus address 0x18.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x06C0	0x06FF
		0x06C0	0x06FF	
0x29	S-ECM25GroupId	Single S-ECM identifier.		
		Modbus address 0x19.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0700	0x073F
		0x0700	0x073F	
0x2A	S-ECM26GroupId	Single S-ECM identifier.		
		Modbus address 0x1A.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0740	0x077F
		0x0740	0x077F	
0x2B	S-ECM27GroupId	Single S-ECM identifier.		
		Modbus address 0x1B.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0780	0x07BF
		0x0780	0x07BF	

0x2C	S-ECM28GroupId	Single S-ECM identifier.		
		Modbus address 0x1C.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x07C0	0x07FF
		0x07C0	0x07FF	
0x2D	S-ECM29GroupId	Single S-ECM identifier.		
		Modbus address 0x1D.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0800	0x083F
		0x0800	0x083F	
0x2E	S-ECM30GroupId	Single S-ECM identifier.		
		Modbus address 0x1E.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0840	0x087F
		0x0840	0x087F	
0x2F	S-ECM31GroupId	Single S-ECM identifier.		
		Modbus address 0x1F.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Input registers	0x0880	0x08BF
		0x0880	0x08BF	
0x40	GroupCount	S-ECM group count connected to S-TOUCH.		

0x41	Group01Id	First S-ECM group identifier.		
		<b>Value</b>	<b>Name</b>	<b>Description</b>
		0	Non	No S-ECM connected
		3	GroupSOLANO	S-ECM - SOLANO
		4	GroupSOLANO COMBI	S-ECM – SOLANO COMBI
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
Holding registers	0x1000	0x10FF		
0x42	Group02Id	Second S-ECM group identifier.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Holding registers	0x1100	0x11FF
0x43	Group03Id	Third S-ECM group identifier.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Holding registers	0x1200	0x12FF
0x44	Group04Id	Fourth S-ECM group identifier.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Holding registers	0x1300	0x13FF
0x45	Group05Id	Fifth S-ECM group identifier.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Holding registers	0x1400	0x14FF



0x46	Group06Id	Sixth S-ECM group identifier.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Holding registers	0x1500	0x15FF
0x47	Group07Id	Seventh S-ECM group identifier.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Holding registers	0x1600	0x16FF
0x48	Group08Id	Eight S-ECM group identifier.		
		<b>Address space</b>	<b>First address</b>	<b>Last address</b>
		Holding registers	0x1700	0x17FF

## Group S-ECM

### Modbus Holding Registers

#### Data:

Address	Name	Description															
0x04	WorkMode	<p>Work mode</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Work status</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>WM_NS</td> <td>Read only</td> </tr> <tr> <td>1</td> <td>WM_OFF</td> <td>Device off</td> </tr> <tr> <td>2</td> <td>WM_HEAT</td> <td>Heat mode</td> </tr> <tr> <td>3</td> <td>WM_VENT</td> <td>Ventilation mode</td> </tr> </tbody> </table>	Value	Work status	Description	0	WM_NS	Read only	1	WM_OFF	Device off	2	WM_HEAT	Heat mode	3	WM_VENT	Ventilation mode
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2	WM_HEAT	Heat mode															
3	WM_VENT	Ventilation mode															
0x05	CurtainFanSpeedRef	<p>Forcing fan speed (S1, S2, S3).</p> <p><i>AC Fan - 3 steps.</i></p> <table border="1"> <thead> <tr> <th>Value</th> <th>Gear</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>0</b></td> <td><b>FAN_SPEED0</b></td> <td><b>Fan off</b></td> </tr> <tr> <td>1..33</td> <td>FAN_SPEED1</td> <td>First step</td> </tr> <tr> <td>34..66</td> <td>FAN_SPEED2</td> <td>Second step</td> </tr> <tr> <td>67..100</td> <td>FAN_SPEED3</td> <td>Third step</td> </tr> </tbody> </table>	Value	Gear	Description	<b>0</b>	<b>FAN_SPEED0</b>	<b>Fan off</b>	1..33	FAN_SPEED1	First step	34..66	FAN_SPEED2	Second step	67..100	FAN_SPEED3	Third step
Value	Gear	Description															
<b>0</b>	<b>FAN_SPEED0</b>	<b>Fan off</b>															
1..33	FAN_SPEED1	First step															
34..66	FAN_SPEED2	Second step															
67..100	FAN_SPEED3	Third step															
0x06	CurtainHeatRef	<p>Forcing T input (only for curtain setup).</p> <p><b>Read only</b></p>															
0x07	ContactDoor	<p>Forcing DC input</p> <p><b>Read only</b></p>															
0x08	CurtainProgram	<p>Curtain program setting.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Setting</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>CURT_PRG_NS</td> <td>No forcing</td> </tr> <tr> <td>1</td> <td>CURT_PRG_K1</td> <td>Forcing SW3 to value K1</td> </tr> <tr> <td>2</td> <td>CURT_PRG_K2</td> <td>Forcing SW3 to value K2</td> </tr> </tbody> </table>	Value	Setting	Description	0	CURT_PRG_NS	No forcing	1	CURT_PRG_K1	Forcing SW3 to value K1	2	CURT_PRG_K2	Forcing SW3 to value K2			
Value	Setting	Description															
0	CURT_PRG_NS	No forcing															
1	CURT_PRG_K1	Forcing SW3 to value K1															
2	CURT_PRG_K2	Forcing SW3 to value K2															

0x09	CurtainFanIdleRef	<p>Stand-by fan operation.</p> <p><i>AC Fan - 3 steps.</i></p> <table border="1" data-bbox="548 338 984 600"> <thead> <tr> <th>Value</th> <th>Gear</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>0</b></td> <td><b>FAN_SPEED0</b></td> <td><b>Fan off</b></td> </tr> <tr> <td>1..33</td> <td>FAN_SPEED1</td> <td>First step</td> </tr> <tr> <td>34..66</td> <td>FAN_SPEED2</td> <td>Second step</td> </tr> <tr> <td>67..100</td> <td>FAN_SPEED3</td> <td>Third step</td> </tr> </tbody> </table>	Value	Gear	Description	<b>0</b>	<b>FAN_SPEED0</b>	<b>Fan off</b>	1..33	FAN_SPEED1	First step	34..66	FAN_SPEED2	Second step	67..100	FAN_SPEED3	Third step
Value	Gear	Description															
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1..33	FAN_SPEED1	First step															
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67..100	FAN_SPEED3	Third step															
0x0A	FanIdleDelay	<p>Time delay of stand-by fan operation.</p> <table border="1" data-bbox="548 695 862 852"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0..65534</td> <td>Delay in seconds</td> </tr> <tr> <td>65535</td> <td>Infinite</td> </tr> </tbody> </table>	Value	Description	0..65534	Delay in seconds	65535	Infinite									
Value	Description																
0..65534	Delay in seconds																
65535	Infinite																
0x0B	ValveIdleDelay	<p>Time delay of valve in stand-by fan operation.</p> <table border="1" data-bbox="548 940 862 1098"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0..65534</td> <td>Delay in seconds</td> </tr> <tr> <td>65535</td> <td>Infinite</td> </tr> </tbody> </table> <p>Condition:</p> <p>ValveIdleDelay&lt;FanIdleDelay</p>	Value	Description	0..65534	Delay in seconds	65535	Infinite									
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0..65534	Delay in seconds																
65535	Infinite																

## S-ECM

Chapter includes BMS information about air curtains from SOLANO family in single mode.

### Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Ventilation	0x04	WorkMode	0x03	Device starts ventilating (fan efficiency - med). Condition: door contact contactors closed.
	0x05	CurtainFanSpeedRef	66	
	0x0D	CurtainProgram	2	Check temperature sensors, fuse, antifreeze otherwise.
Heating mode	0x04	WorkMode	0x02	Device starts heating (fan efficiency - high, opening valve actuator) target temperature to attain = 40°C.
	0x05	CurtainFanSpeedRef	100	
	0x0A	Tref	400	Check temperature sensors, fuse, antifreeze otherwise.

### Single mode using S-TOUCH as a gate:

S-ECM 10 (physical address set on a PCB board)

Address shift for device no. 10 → 0x03C0 (*Input Register 0x1A* from System settings - *\_Input Registers*)

Mode	Shifted address	Value Change
Ventilation	0x0344 (0x04+0x0340)	0x00 → 0x03
	0x0345 (0x05+0x0340)	0 → 66
	0x034D (0x0D+0x0340)	0 → 2

## Single S-ECM

## Holding Registers

### Data:

Address	Name	Description															
0x04	WorkMode	<p>Work mode</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Work status</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>WM_NS</td> <td>Read only</td> </tr> <tr> <td>1</td> <td>WM_OFF</td> <td>Device off</td> </tr> <tr> <td>2</td> <td>WM_HEAT</td> <td>Heat mode</td> </tr> <tr> <td>3</td> <td>WM_VENT</td> <td>Ventilation mode</td> </tr> </tbody> </table>	Value	Work status	Description	0	WM_NS	Read only	1	WM_OFF	Device off	2	WM_HEAT	Heat mode	3	WM_VENT	Ventilation mode
Value	Work status	Description															
0	WM_NS	Read only															
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0x05	CurtainFanSpeedRef	<p>Forcing fan speed (S1, S2, S3). S-ECM switch SW3 = C (curtain). <i>AC Fan - 3 steps.</i></p> <table border="1"> <thead> <tr> <th>Value</th> <th>Gear</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>FAN_SPEED0</td> <td>Fan off</td> </tr> <tr> <td>1..33</td> <td>FAN_SPEED1</td> <td>First step</td> </tr> <tr> <td>34..66</td> <td>FAN_SPEED2</td> <td>Second step</td> </tr> <tr> <td>67..100</td> <td>FAN_SPEED3</td> <td>Third step</td> </tr> </tbody> </table>	Value	Gear	Description	0	FAN_SPEED0	Fan off	1..33	FAN_SPEED1	First step	34..66	FAN_SPEED2	Second step	67..100	FAN_SPEED3	Third step
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0x06	CurtainHeatRef	<p>Forcing T input. S-ECM switch SW3 = C (curtain).</p> <table border="1"> <thead> <tr> <th></th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>HEAT_NS</td> <td>Read only</td> </tr> <tr> <td>1</td> <td>HEAT_ON</td> <td>ON</td> </tr> <tr> <td>2</td> <td>HEAT_OFF</td> <td>OFF</td> </tr> </tbody> </table>		Name	Description	0	HEAT_NS	Read only	1	HEAT_ON	ON	2	HEAT_OFF	OFF			
	Name	Description															
0	HEAT_NS	Read only															
1	HEAT_ON	ON															
2	HEAT_OFF	OFF															

0x07	HeaterFanSpeedRef	<p>Forcing fan speed (S1, S2, S3). S-ECM switch SW3 = H (heater).</p> <p><i>AC Fan - 3 steps.</i></p> <table border="1" data-bbox="662 338 1092 600"> <thead> <tr> <th>Value</th> <th>Gear</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>FAN_SPEED0</td> <td>Fan off</td> </tr> <tr> <td>1..33</td> <td>FAN_SPEED1</td> <td>First step</td> </tr> <tr> <td>34..66</td> <td>FAN_SPEED2</td> <td>Second step</td> </tr> <tr> <td>67..100</td> <td>FAN_SPEED3</td> <td>Third step</td> </tr> </tbody> </table>	Value	Gear	Description	0	FAN_SPEED0	Fan off	1..33	FAN_SPEED1	First step	34..66	FAN_SPEED2	Second step	67..100	FAN_SPEED3	Third step
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67..100	FAN_SPEED3	Third step															
0x08	HeaterHeatRef	<p>Forcing T input. S-ECM switch SW3 = H (heater).</p> <table border="1" data-bbox="662 695 997 905"> <thead> <tr> <th></th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>HEAT_NS</td> <td>Read only</td> </tr> <tr> <td>1</td> <td>HEAT_ON</td> <td>ON</td> </tr> <tr> <td>2</td> <td>HEAT_OFF</td> <td>OFF</td> </tr> </tbody> </table>		Name	Description	0	HEAT_NS	Read only	1	HEAT_ON	ON	2	HEAT_OFF	OFF			
	Name	Description															
0	HEAT_NS	Read only															
1	HEAT_ON	ON															
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0x09	ContactDoor	<p>Forcing Contact Door.</p> <table border="1" data-bbox="662 993 1312 1203"> <thead> <tr> <th>Value</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>DOOR_NS</td> <td>Not set</td> </tr> <tr> <td>1</td> <td>DOOR_OPEN</td> <td>Forcing open contact door signal</td> </tr> <tr> <td>2</td> <td>DOOR_CLOSE</td> <td>Forcing close contact door signal</td> </tr> </tbody> </table>	Value	Name	Description	0	DOOR_NS	Not set	1	DOOR_OPEN	Forcing open contact door signal	2	DOOR_CLOSE	Forcing close contact door signal			
Value	Name	Description															
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1	DOOR_OPEN	Forcing open contact door signal															
2	DOOR_CLOSE	Forcing close contact door signal															
0x0A	Tref	<p>Target temperature.</p> <table border="1" data-bbox="662 1297 1102 1455"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>5,0</td> <td>Minimal Value</td> </tr> <tr> <td>450</td> <td>45,0</td> <td>Maximal Value</td> </tr> </tbody> </table>	Value	Temperature	Description	50	5,0	Minimal Value	450	45,0	Maximal Value						
Value	Temperature	Description															
50	5,0	Minimal Value															
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0x0B	TLeadVal	<p>Lead temperature sensor value.</p> <table border="1" data-bbox="662 1545 1102 1703"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>-600</td> <td>-60,0</td> <td>Minimal Value</td> </tr> <tr> <td>600</td> <td>60,0</td> <td>Maximal Value</td> </tr> </tbody> </table>	Value	Temperature	Description	-600	-60,0	Minimal Value	600	60,0	Maximal Value						
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-600	-60,0	Minimal Value															
600	60,0	Maximal Value															

0x0C	TLeadSensorSelect	<p>Lead temperature sensor selection.</p> <table border="1" data-bbox="662 268 1386 428"> <thead> <tr> <th>Value</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TSL_TLEAD</td> <td>Value sent by ModBus (TLeadVal)</td> </tr> <tr> <td>3</td> <td>TSL_T4</td> <td>S-ECM temperature sensor (T4 connector)</td> </tr> </tbody> </table>	Value	Name	Description	1	TSL_TLEAD	Value sent by ModBus (TLeadVal)	3	TSL_T4	S-ECM temperature sensor (T4 connector)						
Value	Name	Description															
1	TSL_TLEAD	Value sent by ModBus (TLeadVal)															
3	TSL_T4	S-ECM temperature sensor (T4 connector)															
0x0D	CurtainProgram	<p>Curtain program setting.</p> <table border="1" data-bbox="662 520 1243 730"> <thead> <tr> <th>Value</th> <th>Setting</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>CURT_PRG_NS</td> <td>No forcing</td> </tr> <tr> <td>1</td> <td>CURT_PRG_K1</td> <td>Forcing SW3 to value K1</td> </tr> <tr> <td>2</td> <td>CURT_PRG_K2</td> <td>Forcing SW3 to value K2</td> </tr> </tbody> </table>	Value	Setting	Description	0	CURT_PRG_NS	No forcing	1	CURT_PRG_K1	Forcing SW3 to value K1	2	CURT_PRG_K2	Forcing SW3 to value K2			
Value	Setting	Description															
0	CURT_PRG_NS	No forcing															
1	CURT_PRG_K1	Forcing SW3 to value K1															
2	CURT_PRG_K2	Forcing SW3 to value K2															
0x0E	CurtainFanIdleRef	<p>Stand-by fan operation for curtain.</p> <p><i>AC Fan - 3 steps.</i></p> <table border="1" data-bbox="662 888 1091 1150"> <thead> <tr> <th>Value</th> <th>Gear</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>FAN_SPEED0</td> <td>Fan off</td> </tr> <tr> <td>1..33</td> <td>FAN_SPEED1</td> <td>First step</td> </tr> <tr> <td>34..66</td> <td>FAN_SPEED2</td> <td>Second step</td> </tr> <tr> <td>67..100</td> <td>FAN_SPEED3</td> <td>Third step</td> </tr> </tbody> </table>	Value	Gear	Description	0	FAN_SPEED0	Fan off	1..33	FAN_SPEED1	First step	34..66	FAN_SPEED2	Second step	67..100	FAN_SPEED3	Third step
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34..66	FAN_SPEED2	Second step															
67..100	FAN_SPEED3	Third step															
0x0F	HeaterFanIdleRef	<p>Stand-by fan operation for heater.</p> <p><i>AC Fan - 3 steps.</i></p> <table border="1" data-bbox="662 1308 1091 1570"> <thead> <tr> <th>Value</th> <th>Gear</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>FAN_SPEED0</td> <td>Fan off</td> </tr> <tr> <td>1..33</td> <td>FAN_SPEED1</td> <td>First step</td> </tr> <tr> <td>34..66</td> <td>FAN_SPEED2</td> <td>Second step</td> </tr> <tr> <td>67..100</td> <td>FAN_SPEED3</td> <td>Third step</td> </tr> </tbody> </table>	Value	Gear	Description	0	FAN_SPEED0	Fan off	1..33	FAN_SPEED1	First step	34..66	FAN_SPEED2	Second step	67..100	FAN_SPEED3	Third step
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34..66	FAN_SPEED2	Second step															
67..100	FAN_SPEED3	Third step															
0x10	FanIdleDelay	<p>Time delay of stand-by fan operation.</p> <table border="1" data-bbox="662 1665 976 1822"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0..65534</td> <td>Delay in seconds</td> </tr> <tr> <td>65535</td> <td>Infinite</td> </tr> </tbody> </table>	Value	Description	0..65534	Delay in seconds	65535	Infinite									
Value	Description																
0..65534	Delay in seconds																
65535	Infinite																

0x11	ValveIdleDelay	<p>Time delay of valve in stand-by fan operation.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0..65534</td> <td>Delay in seconds</td> </tr> <tr> <td>65535</td> <td>Infinite</td> </tr> </tbody> </table> <p>Condition: ValveIdleDelay&lt;FanIdleDelay.</p>	Value	Description	0..65534	Delay in seconds	65535	Infinite			
Value	Description										
0..65534	Delay in seconds										
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0x12	AntifreezeWareHouseOn	<p>Antifreeze work mode.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0x01</td> <td>WM_ON</td> <td>ON</td> </tr> <tr> <td>0x02</td> <td>WM_OFF</td> <td>OFF</td> </tr> </tbody> </table>	Value	Name	Description	0x01	WM_ON	ON	0x02	WM_OFF	OFF
Value	Name	Description									
0x01	WM_ON	ON									
0x02	WM_OFF	OFF									
0x13	AntifreezeWareHouseTempRef	<p>Target temperature to enable antifreeze.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>5,0</td> <td>Minimal value</td> </tr> <tr> <td>150</td> <td>15,0</td> <td>Maximal value</td> </tr> </tbody> </table>	Value	Temperature	Description	50	5,0	Minimal value	150	15,0	Maximal value
Value	Temperature	Description									
50	5,0	Minimal value									
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## Input Registers

(READ ONLY)

### Data:

Address	Name	Description															
0x04	T3	<p>Temperature measured by T3 sensor (air after water heat exchanger).</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>-350</td> <td>-35,0</td> <td>Minimal value</td> </tr> <tr> <td>350</td> <td>35,0</td> <td>Maximal value</td> </tr> <tr> <td>0x7000</td> <td>-</td> <td>Short circuit</td> </tr> <tr> <td>0x7FFF</td> <td>-</td> <td>PT1000 sensor not connected</td> </tr> </tbody> </table>	Value	Temperature	Description	-350	-35,0	Minimal value	350	35,0	Maximal value	0x7000	-	Short circuit	0x7FFF	-	PT1000 sensor not connected
Value	Temperature	Description															
-350	-35,0	Minimal value															
350	35,0	Maximal value															
0x7000	-	Short circuit															
0x7FFF	-	PT1000 sensor not connected															



0x05	T4	<p>Temperature measured by T4 sensor (air before water heat exchanger).</p> <table border="1" data-bbox="553 275 1159 533"> <thead> <tr> <th>Value</th> <th>Temperature</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>-350</td> <td>35,0</td> <td>Minimal value</td> </tr> <tr> <td>350</td> <td>35,0</td> <td>Maximal value</td> </tr> <tr> <td>0x7000</td> <td>-</td> <td>Short circuit</td> </tr> <tr> <td>0x7FFF</td> <td>-</td> <td>PT1000 sensor not connected</td> </tr> </tbody> </table>	Value	Temperature	Description	-350	35,0	Minimal value	350	35,0	Maximal value	0x7000	-	Short circuit	0x7FFF	-	PT1000 sensor not connected
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350	35,0	Maximal value															
0x7000	-	Short circuit															
0x7FFF	-	PT1000 sensor not connected															
0x06	CurtainFanSpeed	<p>Curtain fan speed (S1, S2, S3).</p> <p><i>AC Fan - 3 steps.</i></p> <table border="1" data-bbox="553 695 984 953"> <thead> <tr> <th>Value</th> <th>Gear</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>FAN_SPEED0</td> <td>Fan off</td> </tr> <tr> <td>1..33</td> <td>FAN_SPEED1</td> <td>First step</td> </tr> <tr> <td>34..66</td> <td>FAN_SPEED2</td> <td>Second step</td> </tr> <tr> <td>67..100</td> <td>FAN_SPEED3</td> <td>Third step</td> </tr> </tbody> </table>	Value	Gear	Description	0	FAN_SPEED0	Fan off	1..33	FAN_SPEED1	First step	34..66	FAN_SPEED2	Second step	67..100	FAN_SPEED3	Third step
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0x07	ValveState	<p>Valve state.</p> <table border="1" data-bbox="553 1052 1320 1257"> <thead> <tr> <th>Value</th> <th>Name</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0x00</td> <td>VALVE_IDLE</td> <td>Valve in stand by mode (for 3-way valves)</td> </tr> <tr> <td>0x01</td> <td>VALVE_OPEN</td> <td>Opening valve</td> </tr> <tr> <td>0x02</td> <td>VALVE_CLOSE</td> <td>Closing valve</td> </tr> </tbody> </table>	Value	Name	Description	0x00	VALVE_IDLE	Valve in stand by mode (for 3-way valves)	0x01	VALVE_OPEN	Opening valve	0x02	VALVE_CLOSE	Closing valve			
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0x01	VALVE_OPEN	Opening valve															
0x02	VALVE_CLOSE	Closing valve															
0x08	HeaterFanSpeed	<p>Heater fan speed (S1, S2, S3).</p> <p><i>AC Fan - 3 steps.</i></p> <table border="1" data-bbox="553 1419 984 1677"> <thead> <tr> <th>Value</th> <th>Gear</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>FAN_SPEED0</td> <td>Fan off</td> </tr> <tr> <td>1..33</td> <td>FAN_SPEED1</td> <td>First step</td> </tr> <tr> <td>34..66</td> <td>FAN_SPEED2</td> <td>Second step</td> </tr> <tr> <td>67..100</td> <td>FAN_SPEED3</td> <td>Third step</td> </tr> </tbody> </table>	Value	Gear	Description	0	FAN_SPEED0	Fan off	1..33	FAN_SPEED1	First step	34..66	FAN_SPEED2	Second step	67..100	FAN_SPEED3	Third step
Value	Gear	Description															
0	FAN_SPEED0	Fan off															
1..33	FAN_SPEED1	First step															
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67..100	FAN_SPEED3	Third step															

0x09	ContactDoor	Contact door state.			
		<b>Value</b>	<b>Name</b>	<b>Description</b>	
		0x01	DOOR_OPEN	Door open	
		0x02	DOOR_CLOSE	Door close	
0x0A	HeaterDetect	Heater detection procedure (ELIS-DUO).			
		<b>Value</b>	<b>Name</b>	<b>Description</b>	
		0x00	HEATER_DT_NS	Detection procedure not commenced	
		0x01	HEATER_DT_FAIL	Heater not detected	
		0x02	HEATER_DT_PASS	Heater detected	
0x0B	AntifreezeeState	Information about antifreeze (8 bits for respected mode).			
		<b>Value 15..8 bit</b>	<b>Value 7..0 bit</b>	<b>Antifreeze</b>	<b>Description</b>
		0x01	-	Warehouse	Normal work mode.
		0x02	-	Warehouse	Antifreeze enabled (user parameters overwritten).
		-	0x01	Water Exchanger	Normal work mode.
		-	0x02	Water Exchanger	Antifreeze enabled (user parameters overwritten).

<p>0x0C</p>	<p>FuseState</p>	<p>Fuse state for 3V fans, information can be read from 4 bits (11..8 bit).</p> <table border="1" data-bbox="553 275 971 485"> <thead> <tr> <th>Value 11..8 bit</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0x00</td> <td>Read only</td> </tr> <tr> <td>0x01</td> <td>Fuse state - working</td> </tr> <tr> <td>0x02</td> <td>Fuse state - blown</td> </tr> </tbody> </table> <p>Example:</p> <p>Fuse state 3V fan: working (0x1)</p> <p>Register value: 0x0010</p> <p>Fuse state 3V fan: blown (0x2)</p> <p>Register value: 0x0020</p>	Value 11..8 bit	Description	0x00	Read only	0x01	Fuse state - working	0x02	Fuse state - blown								
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<p>0x0D</p>	<p>CurtainElectricpower</p>	<p>Electric heater power.</p> <table border="1" data-bbox="553 982 1182 1192"> <thead> <tr> <th>Value</th> <th>Name</th> <th>L2 output</th> <th>L1 output</th> </tr> </thead> <tbody> <tr> <td>0x00</td> <td>ELECTRIC_POWER_0</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>0x01</td> <td>ELECTRIC_POWER_1</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>0x02</td> <td>ELECTRIC_POWER_2</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table> <p>L1, L2 outputs are located on VALVE connector.</p>	Value	Name	L2 output	L1 output	0x00	ELECTRIC_POWER_0	OFF	OFF	0x01	ELECTRIC_POWER_1	OFF	ON	0x02	ELECTRIC_POWER_2	ON	ON
Value	Name	L2 output	L1 output															
0x00	ELECTRIC_POWER_0	OFF	OFF															
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