Building Management System and T-Box integration

Modbus Documentation

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
7	Addressing convention	Register address starting from 0
8	Data type	Unsigned Int16 (if not stated otherwise)

MODBUS functions:

Read Holding Register	0x03
Read Input Register	0x04
Write Single Register	0x06
Write Multiple Registers	0x10
Read / Write Multiple Register	0x17

Quick Start (CLICK!):

- DRV-ELIS
- DRV-D
- DRV-KM
- DRV-V&M
- DRV-OXEN
- DRV-R
- DRV-R KM
- DRV-EL

(version 1.0.30)

T-BOX settings

Flowair system can be controlled via Building Management System (refereed to as BMS) using T-Box as a gate to access all available Flowair devices. There are to 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.

BMS Single driver mode.

Direct access to DRV settings. T-box 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 T-Box.

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 DRIVER PCB. The information about the shift can be found in a sub-chapter called Input Registers.

Example:

- DRV - ELIS with address 0x04
- check Drv04GroupId register and it's value (can be found in a sub-chapter called Input Registers) it should be equal to 0x03 (DRV - ELIS)

<table>
<tr>
<td>0x14</td>
<td>Drv04GroupId</td>
<td>Single DRV identifier.
Modbus address 0x04.
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Input registers</td><td>0x01C0</td><td>0x01FF</td></tr>
<tr><td>Holding registers</td><td>0x01C0</td><td>0x01FF</td></tr>
</table>
</td>
</tr>
</table>

- 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 DRV documentation and add it to firs address e.g.
  - DRV-ELIS Holding Registers Address 0x04 (WorkMode)
  - First address 0x01C0 (Group 4)
  - DRV-ELIS Holding Register Address via BMS T-Box gate 0x04 + 0x01C0 = 0x01C4

BMS Group mode.

Indirect access to DRV settings via groups. T-Box settings are unblocked and can be freely modified by BMS. Group is a compilation of the same products connected to T-Box (Leo D, Leo V, Leo M, Leo KM, ELiS, DUO, OXeN). Every change in (for example) OXeN group will modify settings for all OXeN's connected to single T-Box.

Single driver settings are read only.

How to extract and change group registers?

BMS Work parameter has to be set to 0x02. Driver holding and input registers are shifted depending on the group. There can be maximum eight groups (there are eight groups: Leo D, Leo V, Leo M, Leo KM, ELiS, DUO, OXeN. One group 'NON' is control: empty), to identify which driver is assigned to which group read adequate register address.

Example:

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

<table>
<tr>
<td>0x42</td>
<td>Group02Id</td>
<td>Second DRV group identifier.

<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Holding registers</td><td>0x1100</td><td>0x11FF</td></tr>
</table>
</td>
</tr>
</table>

- 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 DRV documentation and add it to first address e.g.
    - GroupElis Holding Registers Address 0x04 (WorkMode)
    - First address 0x1100 (Second DRV group)
    - GroupElis Holding Address via BMS T-Box gate 0x04+0x1100 = 0x1104

_Holding registers

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>Rsv</td><td>Reserved.</td></tr>
<tr><td>0x01</td><td>SoftType</td><td>Enables software setup.
Information about program type and it's version. Description is split between <MSB> <LSB>.
<MSB> software version
0x00 - T-Box
<LSB> software programming options (implemented for future use).
<table><tr><td><LSB></td><td>Option name</td><td>Description</td></tr><tr><td>0x02</td><td>MAIN</td><td>Main software version</td></tr></table></td></tr>
<tr><td>0x02</td><td>Rsv</td><td>Reserved.</td></tr>
<tr><td>0x03</td><td>Rsv</td><td>Reserved.</td></tr>
<tr><td>0x04</td><td>BmsMode</td><td>BMS work mode.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x0001</td><td>BMS_WM_RAW</td><td>Direct access to DRV settings. T-box settings blocked.</td></tr><tr><td>0x0002</td><td>BMS_WM_GROUP</td><td>Indirect access to DRV settings via groups. T-box settings unblocked.</td></tr></table></td></tr>
<tr><td>0x05</td><td>Enable</td><td>Enables/disables T-Box and DRV.
• 0 - disable
• 1..65535 - enable</td></tr>
<tr><td>0x06</td><td>Tref</td><td>Target reference temperature for all drivers.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x07</td><td>AntifreezeWareHouseEnable</td><td>Enables/disables warehouse antifreeze mode.
• 0 - disable
• 1..65535 - enable</td></tr>
<tr><td>0x08</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable warehouse antifreeze.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x09</td><td>TleadSensorSelect</td><td>Leading sensor selection.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>1</td><td>TSL_TLEAD</td><td>T-Box leading sensor temperature.</td></tr><tr><td>3</td><td>TSL_T4</td><td>DRV sensor temperature (T4 connector)</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x0A</td><td>Tsl_Tlead_Offset</td><td>T-Box temperature sensor offset.<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0B</td><td>Tsl_T4_Offset</td><td>DRV temperature sensor offset (regards all T4 sensors).<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0C</td><td>GasSensorEnable</td><td>Enables/disables two-step alarm threshold from CO2 gas detector connected to DRV-KM or DRV-OXeN.
0 - disable
1..65535 - enable</td></tr>
<tr><td>0x0D</td><td>GasSensorConnectId</td><td>DRV-KM, DRV-OXeN modbus address with two-step threshold CO2 gas detector connected.</td></tr>
<tr><td>0x0E</td><td>DateYear</td><td>Set year.<table><tr><th>Value</th><th>Description</th></tr><tr><td>2014</td><td>Minimal value</td></tr><tr><td>2100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0F</td><td>DateMonth</td><td>Set month.
Range from 1 to 12.</td></tr>
<tr><td>0x10</td><td>DateDay</td><td>Set day.
Range from 1 to 31.</td></tr>
<tr><td>0x11</td><td>DateHours</td><td>Set hour.
Range from 0 to 23.</td></tr>
<tr><td>0x12</td><td>DateMinutes</td><td>Set minute.
Range from 0 to 59.</td></tr>
<tr><td>0x13</td><td>DateSeconds</td><td>Set second.
Range from 0 to 59.</td></tr>
</table>

_Input registers

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>HardwareType</td><td>Information about hardware type and it's version.
Description is split between <MSB> <LSB>.
<MSB> PCB name.
0x00 - T-Box
<LSB> PCB version.

PCB version is described by BCD code. e.g. for 1.0 version <LSB> = 0x10.</td></tr>
<tr><td>0x01</td><td>SoftType</td><td>Information about software type.
Information about program type and it's version. Description is split between <MSB> <LSB>.
<MSB> software version
0x00 - T-Box
<LSB> software programming options (implemented for future use)

<table><tr><td><LSB></td><td>Option name</td><td>Description</td></tr><tr><td>0x02</td><td>MAIN</td><td>Main program version</td></tr></table></td></tr>
<tr><td>0x02</td><td>ConnectionCnt</td><td>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).</td></tr>
<tr><td>0x03</td><td>SoftVer</td><td>Software version.
<table><tr><th>Bits</th><th>Range</th><th>Description</th></tr><tr><td>0-3</td><td>0x1 / 0xF</td><td>TAG</td></tr><tr><td>4-7</td><td>0x0 / 0xF</td><td>MINOR</td></tr><tr><td>8-11</td><td>0x0 / 0xF</td><td>MAJOR</td></tr><tr><td>12-15</td><td>0x00</td><td>Reserved</td></tr></table></td></tr>
<tr><td>0x05</td><td>TempTBox</td><td>Temperature measured by build-in T-Box sensor.</td></tr>
<tr><td>0x06</td><td>TempT4Ave</td><td>Mean temperature measured by all T4 sensors connected to DRV.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x10</td><td>DrvCount</td><td>DRV count connected to T-Box.
Range from 0 to 31</td></tr>
</table>

<table>
<tr>
<td>0x11</td>
<td>Drv01GroupId</td>
<td>Single DRV identifier.
Modbus address 0x01.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>Non</td><td>No DRV connected</td></tr>
<tr><td>0x01</td><td>GroupOxen</td><td>DRV - Oxen</td></tr>
<tr><td>0x02</td><td>GroupKm</td><td>DRV - KM</td></tr>
<tr><td>0x03</td><td>GroupElis</td><td>DRV - ELIS</td></tr>
<tr><td>0x04</td><td>GroupElisDuo</td><td>DRV - ELIS DUO</td></tr>
<tr><td>0x05</td><td>GroupLeoV</td><td>DRV - V</td></tr>
<tr><td>0x06</td><td>GroupLeoM</td><td>DRV - M</td></tr>
<tr><td>0x07</td><td>GroupLeoD</td><td>DRV - D</td></tr>
<tr><td>0x0C</td><td>GroupRobur</td><td>DRV-R</td></tr>
<tr><td>0x0D</td><td>GroupRoburKM</td><td>DRV-R-KM</td></tr>
<tr><td>0x0E</td><td>GroupLeoEL</td><td>DRV-EL</td></tr>
<tr><td>0x14</td><td>GroupLeoDEC</td><td>DRV-D EC</td></tr>
<tr><td>0x15</td><td>GroupRoburNext</td><td>DRV-ROBUR NEXT</td></tr>
<tr><td>0x16</td><td>GroupRoburNextKM</td><td>DRV-ROBUR NEXT KM</td></tr>
</table>
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Input registers</td><td>0x0100</td><td>0x013F</td></tr>
<tr><td>Holding registers</td><td>0x0100</td><td>0x013F</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x12</td>
<td>Drv02GroupId</td>
<td>Single DRV identifier.
Modbus address 0x02.
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Input registers</td><td>0x0140</td><td>0x017F</td></tr>
<tr><td>Holding registers</td><td>0x0140</td><td>0x017F</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x13</td>
<td>Drv03GroupId</td>
<td>Single DRV identifier.
Modbus address 0x03.
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Input registers</td><td>0x0180</td><td>0x01BF</td></tr>
<tr><td>Holding registers</td><td>0x0180</td><td>0x01BF</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><td>0x14</td><td>Drv04GroupId</td><td>Single DRV identifier.
Modbus address 0x04.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x01C0</td><td>0x01FF</td></tr><tr><td>Holding registers</td><td>0x01C0</td><td>0x01FF</td></tr></table></td></tr>
<tr><td>0x15</td><td>Drv05GroupId</td><td>Single DRV identifier.
Modbus address 0x05.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0200</td><td>0x023F</td></tr><tr><td>Holding registers</td><td>0x0200</td><td>0x023F</td></tr></table></td></tr>
<tr><td>0x16</td><td>Drv06GroupId</td><td>Single DRV identifier.
Modbus address 0x06.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0240</td><td>0x027F</td></tr><tr><td>Holding registers</td><td>0x0240</td><td>0x027F</td></tr></table></td></tr>
<tr><td>0x17</td><td>Drv07GroupId</td><td>Single DRV identifier.
Modbus address 0x07.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0280</td><td>0x02BF</td></tr><tr><td>Holding registers</td><td>0x0280</td><td>0x02BF</td></tr></table></td></tr>
<tr><td>0x18</td><td>Drv08GroupId</td><td>Single DRV identifier.
Modbus address 0x08.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x02C0</td><td>0x02FF</td></tr><tr><td>Holding registers</td><td>0x02C0</td><td>0x02FF</td></tr></table></td></tr>
<tr><td>0x19</td><td>Drv09GroupId</td><td>Single DRV identifier.
Modbus address 0x09.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0300</td><td>0x033F</td></tr><tr><td>Holding registers</td><td>0x0300</td><td>0x033F</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x1A</td>
<td>Drv10GroupId</td>
<td>Single DRV identifier.
Modbus address 0x0A.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0340</td><td>0x037F</td></tr><tr><td>Holding registers</td><td>0x0340</td><td>0x037F</td></tr></table></td>
</tr>
<tr>
<td>0x1B</td>
<td>Drv11GroupId</td>
<td>Single DRV identifier.
Modbus address 0x0B.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0380</td><td>0x03BF</td></tr><tr><td>Holding registers</td><td>0x0380</td><td>0x03BF</td></tr></table></td>
</tr>
<tr>
<td>0x1C</td>
<td>Drv12GroupId</td>
<td>Single DRV identifier.
Modbus address 0x0C.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x03C0</td><td>0x03FF</td></tr><tr><td>Holding registers</td><td>0x03C0</td><td>0x03FF</td></tr></table></td>
</tr>
<tr>
<td>0x1D</td>
<td>Drv13GroupId</td>
<td>Single DRV identifier.
Modbus address 0x0D.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0400</td><td>0x043F</td></tr><tr><td>Holding registers</td><td>0x0400</td><td>0x043F</td></tr></table></td>
</tr>
<tr>
<td>0x1E</td>
<td>Drv14GroupId</td>
<td>Single DRV identifier.
Modbus address 0x0E.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0440</td><td>0x047F</td></tr><tr><td>Holding registers</td><td>0x0440</td><td>0x047F</td></tr></table></td>
</tr>
<tr>
<td>0x1F</td>
<td>Drv15GroupId</td>
<td>Single DRV identifier.
Modbus address 0x0F.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0480</td><td>0x04BF</td></tr><tr><td>Holding registers</td><td>0x0480</td><td>0x04BF</td></tr></table></td>
</tr>
</table>

<table>
<tr><td>0x20</td><td>Drv16GroupId</td><td>Single DRV identifier.
Modbus address 0x10.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x04C0</td><td>0x04FF</td></tr><tr><td>Holding registers</td><td>0x04C0</td><td>0x04FF</td></tr></table></td></tr>
<tr><td>0x21</td><td>Drv17GroupId</td><td>Single DRV identifier.
Modbus address 0x11.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0500</td><td>0x053F</td></tr><tr><td>Holding registers</td><td>0x0500</td><td>0x053F</td></tr></table></td></tr>
<tr><td>0x22</td><td>Drv18GroupId</td><td>Single DRV identifier.
Modbus address 0x12.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0540</td><td>0x057F</td></tr><tr><td>Holding registers</td><td>0x0540</td><td>0x057F</td></tr></table></td></tr>
<tr><td>0x23</td><td>Drv19GroupId</td><td>Single DRV identifier.
Modbus address 0x13.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0580</td><td>0x05BF</td></tr><tr><td>Holding registers</td><td>0x0580</td><td>0x05BF</td></tr></table></td></tr>
<tr><td>0x24</td><td>Drv20GroupId</td><td>Single DRV identifier.
Modbus address 0x14.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x05C0</td><td>0x05FF</td></tr><tr><td>Holding registers</td><td>0x05C0</td><td>0x05FF</td></tr></table></td></tr>
<tr><td>0x25</td><td>Drv21GroupId</td><td>Single DRV identifier.
Modbus address 0x15.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0600</td><td>0x063F</td></tr><tr><td>Holding registers</td><td>0x0600</td><td>0x063F</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x26</td>
<td>Drv22GroupId</td>
<td>Single DRV identifier.
Modbus address 0x16.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0640</td><td>0x067F</td></tr><tr><td>Holding registers</td><td>0x0640</td><td>0x067F</td></tr></table></td>
</tr>
<tr>
<td>0x27</td>
<td>Drv23GroupId</td>
<td>Single DRV identifier.
Modbus address 0x17.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0680</td><td>0x06BF</td></tr><tr><td>Holding registers</td><td>0x0680</td><td>0x06BF</td></tr></table></td>
</tr>
<tr>
<td>0x28</td>
<td>Drv24GroupId</td>
<td>Single DRV identifier.
Modbus address 0x18.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x06C0</td><td>0x06FF</td></tr><tr><td>Holding registers</td><td>0x06C0</td><td>0x06FF</td></tr></table></td>
</tr>
<tr>
<td>0x29</td>
<td>Drv25GroupId</td>
<td>Single DRV identifier.
Modbus address 0x19.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0700</td><td>0x073F</td></tr><tr><td>Holding registers</td><td>0x0700</td><td>0x073F</td></tr></table></td>
</tr>
<tr>
<td>0x2A</td>
<td>Drv26GroupId</td>
<td>Single DRV identifier.
Modbus address 0x1A.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0740</td><td>0x077F</td></tr><tr><td>Holding registers</td><td>0x0740</td><td>0x077F</td></tr></table></td>
</tr>
<tr>
<td>0x2B</td>
<td>Drv27GroupId</td>
<td>Single DRV identifier.
Modbus address 0x1B.
<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0780</td><td>0x07BF</td></tr><tr><td>Holding registers</td><td>0x0780</td><td>0x07BF</td></tr></table></td>
</tr>
</table>

<table>
<tr><td>0x2C</td><td>Drv28GroupId</td><td>Single DRV identifier.
Modbus address 0x1C.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x07C0</td><td>0x07FF</td></tr><tr><td>Holding registers</td><td>0x07C0</td><td>0x07FF</td></tr></table></td></tr>
<tr><td>0x2D</td><td>Drv29GroupId</td><td>Single DRV identifier.
Modbus address 0x1D.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0800</td><td>0x083F</td></tr><tr><td>Holding registers</td><td>0x0800</td><td>0x083F</td></tr></table></td></tr>
<tr><td>0x2E</td><td>Drv30GroupId</td><td>Single DRV identifier.
Modbus address 0x1E.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0840</td><td>0x087F</td></tr><tr><td>Holding registers</td><td>0x0840</td><td>0x087F</td></tr></table></td></tr>
<tr><td>0x2F</td><td>Drv31GroupId</td><td>Single DRV identifier.
Modbus address 0x1F.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Input registers</td><td>0x0880</td><td>0x08BF</td></tr><tr><td>Holding registers</td><td>0x0880</td><td>0x08BF</td></tr></table></td></tr>
<tr><td>0x40</td><td>GroupCount</td><td>DRV group count connected to T-Box.</td></tr>
</table>

<table>
<tr>
<td>0x41</td>
<td>Group01Id</td>
<td>First DRV group identifier.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>Non</td><td>No DRV connected</td></tr>
<tr><td>0x01</td><td>GroupOxen</td><td>DRV - Oxen</td></tr>
<tr><td>0x02</td><td>GroupKm</td><td>DRV - KM</td></tr>
<tr><td>0x03</td><td>GroupElis</td><td>DRV - ELIS</td></tr>
<tr><td>0x04</td><td>GroupElisDuo</td><td>DRV - ELIS DUO</td></tr>
<tr><td>0x05</td><td>GroupLeoV</td><td>DRV - V</td></tr>
<tr><td>0x06</td><td>GroupLeoM</td><td>DRV - M</td></tr>
<tr><td>0x07</td><td>GroupLeoD</td><td>DRV - D</td></tr>
<tr><td>0x0C</td><td>GroupRobur</td><td>DRV-R</td></tr>
<tr><td>0x0D</td><td>GroupRoburKM</td><td>DRV-R-KM</td></tr>
<tr><td>0x0E</td><td>GroupLeoEL</td><td>DRV-EL</td></tr>
<tr><td>0x14</td><td>GroupLeoDEC</td><td>DRV-D EC</td></tr>
<tr><td>0x15</td><td>GroupRoburNext</td><td>DRV-ROBUR NEXT</td></tr>
<tr><td>0x16</td><td>GroupRoburNextKM</td><td>DRV-ROBUR NEXT KM</td></tr>
</table>
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Holding registers</td><td>0x1000</td><td>0x10FF</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x42</td>
<td>Group02Id</td>
<td>Second DRV group identifier.
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Holding registers</td><td>0x1100</td><td>0x11FF</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x43</td>
<td>Group03Id</td>
<td>Third DRV group identifier.
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Holding registers</td><td>0x1200</td><td>0x12FF</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x44</td>
<td>Group04Id</td>
<td>Fourth DRV group identifier.
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Holding registers</td><td>0x1300</td><td>0x13FF</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x45</td>
<td>Group05Id</td>
<td>Fifth DRV group identifier.
<table>
<tr><th>Address space</th><th>First address</th><th>Last address</th></tr>
<tr><td>Holding registers</td><td>0x1400</td><td>0x14FF</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><td>0x46</td><td>Group06Id</td><td>Sixth DRV group identifier.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Holding registers</td><td>0x1500</td><td>0x15FF</td></tr></table></td></tr>
<tr><td>0x47</td><td>Group07Id</td><td>Seventh DRV group identifier.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Holding registers</td><td>0x1600</td><td>0x16FF</td></tr></table></td></tr>
<tr><td>0x48</td><td>Group08Id</td><td>Eight DRV group identifier.<table><tr><th>Address space</th><th>First address</th><th>Last address</th></tr><tr><td>Holding registers</td><td>0x1700</td><td>0x17FF</td></tr></table></td></tr>
</table>

Single Devices

Single Drivers register maps.

- Holding registers included in this chapter are meant to be used with BMS work mode parameter set to 0x01.
- Input registers included in this chapter can be read with no regards to BMS work mode.

Holding Registers - Header

Data:

Address	Name	Description
0x00	Rsv	Reserved.
0x01	SoftType	Enables software setup. Information about program type and it's version. Description is split between <MSB> <LSB>. <MSB> software version

<MSB>	Name	Description
0x01	OXEN	Software for OXEN
0x02	CURTAIN	Software for curtain
0x03	KM	Software for mixing chamber
0x04	LEO	Software for heater EC
0x05	DESTRATIFICATION UNIT	Software for desertification unit
0x06	CURTAIN_HEATER	Software for curtain-heater
0x07	HEATER_AC	Software for heater AC
0x10	ROBUR_KM	Software for Robur mixing chamber
0x11	ROBUR	Software for Robur heater

<LSB> software programming options (implemented for future use).

<LSB>	Soft name	Description
0x02	MAIN	Main software version

0x02	Not in use	Reserved.
0x03	Not in use	Reserved.

Input Registers Header

(READ ONLY)

Data:

Address	Name	Description

<table>
<tr><td>0x00</td><td>HardwareType</td><td>Information about hardware type and it's version.

Description is split between <MSB> <LSB>.

<MSB> PCB name.

<table>
<tr><th><MSB></th><th>PCB Name</th><th>Description</th></tr>
<tr><td>0x01</td><td>DRV_OXEN</td><td>OXEN driver</td></tr>
<tr><td>0x02</td><td>DRV_ELIS</td><td>ELIS driver</td></tr>
<tr><td>0x03</td><td>DRV_KM</td><td>KM driver</td></tr>
<tr><td>0x04</td><td>DRV_M</td><td>M driver</td></tr>
<tr><td>0x05</td><td>DRV_V</td><td>V driver</td></tr>
</table>

<LSB> PCB version.

PCB version is described by BCD code. e.g. for 1.0 version <LSB> = 0x10.</td></tr>
<tr><td>0x01</td><td>SoftType</td><td>Information about software type.

Information about program type and it's version. Description is split between <MSB> <LSB>.

<MSB> software version

<table>
<tr><th><MSB></th><th>Name</th><th>Description</th></tr>
<tr><td>0x01</td><td>OXEN</td><td>Software for OXEN</td></tr>
<tr><td>0x02</td><td>CURTAIN</td><td>Software for curtain</td></tr>
<tr><td>0x03</td><td>KM</td><td>Software for mixing chamber</td></tr>
<tr><td>0x04</td><td>LEO</td><td>Software for heater EC</td></tr>
<tr><td>0x05</td><td>DESTRATIFICATION UNIT</td><td>Software for desertification unit</td></tr>
<tr><td>0x06</td><td>CURTAIN_HEATER</td><td>Software for curtain-heater</td></tr>
<tr><td>0x07</td><td>HEATER_AC</td><td>Software for heater AC</td></tr>
<tr><td>0x10</td><td>ROBUR_KM</td><td>Software for Robur mixing chamber</td></tr>
<tr><td>0x11</td><td>ROBUR</td><td>Software for Robur heater</td></tr>
</table>

<LSB> software programming options (implemented for future use)</td></tr>
<tr><td>0x02</td><td>ConnectionCnt</td><td>Connection count. Increased each time register is read. First query always returns value 0x01.
If register 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).</td></tr>
<tr><td>0x03</td><td>SoftVer</td><td>Software version.

<table>
<tr><th>BIT</th><th>Description</th></tr>
<tr><td>0...3</td><td>TAG</td></tr>
<tr><td>4...7</td><td>MINOR</td></tr>
<tr><td>8...11</td><td>MAJOR</td></tr>
<tr><td>12...15</td><td>Not in use</td></tr>
</table>
</td></tr>
</table>

DRV-ELIS

Chapter includes BMS information about air curtains from ELIS 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. Check temperature sensors, fuse, antifreeze otherwise.
	0x05	CurtainFanSpeedRef	66	
	0x0D	CurtainProgram	2	
Heating mode	0x04	WorkMode	0x02	Device starts heating (fan efficiency - high, opening valve actuator) target temperature to attain = 40°C. Check temperature sensors, fuse, antifreeze otherwise.
	0x05	CurtainFanSpeedRef	100	
	0x0A	Tref	400	

Single mode using T-BOX as a gate:

DRV-ELIS 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

Input Registers DRV-ELIS

DATA:

(READ ONLY)

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>T3</td><td>Temperature measured by T3 sensor (air after water heat exchanger).
<table>
<tr><th>Value</th><th>Temperature</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>0x05</td><td>T4</td><td>Temperature measured by T4 sensor (air before water heat exchanger).
<table>
<tr><th>Value</th><th>Temperature</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>0x06</td><td>CurtainFanSpeed</td><td>Curtain fan speed (S1, S2, S3).
AC Fan - 3 steps.
<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>0x07</td><td>ValveState</td><td>Valve state.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>0x08</td><td>HeaterFanSpeed</td><td>Heater fan speed (S1, S2, S3).
AC Fan - 3 steps.
<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table></td></tr>
</table>

<table>
<tr><td>0x09</td><td>ContactDoor</td><td>Contact door state.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>DOOR_OPEN</td><td>Door open</td></tr><tr><td>0x02</td><td>DOOR_CLOSE</td><td>Door close</td></tr></table></td></tr>
<tr><td>0x0A</td><td>HeaterDetect</td><td>Heater detection procedure (ELIS-DUO).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>HEATER_DT_NS</td><td>Detection procedure not commenced</td></tr><tr><td>0x01</td><td>HEATER_DT_FAIL</td><td>Heater not detected</td></tr><tr><td>0x02</td><td>HEATER_DT_PASS</td><td>Heater detected</td></tr></table></td></tr>
<tr><td>0x0B</td><td>AntifreezeeState</td><td>Information about antifreeze (8 bits for respected mode).<table><tr><th>Value 15..8 bit</th><th>Value 7..0 bit</th><th>Antifreeze</th><th>Description</th></tr><tr><td>-</td><td>0x01</td><td>Warehouse</td><td>Normal work mode.</td></tr><tr><td>-</td><td>0x02</td><td>Warehouse</td><td>Antifreeze enabled (user parameters overwritten).</td></tr><tr><td>0x01</td><td>-</td><td>Water Exchanger</td><td>Normal work mode.</td></tr><tr><td>0x02</td><td>-</td><td>Water Exchanger</td><td>Antifreeze enabled (user parameters overwritten).</td></tr></table></td></tr>
<tr><td>0x0C</td><td>FuseState</td><td>Fuse state for 3V fans, information can be read from 4 bits (11..8 bit).<table><tr><th>Value 11..8 bit</th><th>Description</th></tr><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></table>Example:
Fuse state 3V fan: working (0x1)
Register value: 0x0010
Fuse state 3V fan: blown (0x2)
Register value: 0x0020</td></tr>
<tr><td>0x0D</td><td>CurtainElectricpower</td><td>Electric heater power.<table><tr><th>Value</th><th>Name</th><th>L2 output</th><th>L1 output</th></tr><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></table>L1, L2 outputs are located on VALVE connector.</td></tr>
</table>

Holding Registers DRV-ELIS

DATA:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode
<table><tr><th>Value</th><th>Work status</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x05</td><td>CurtainFanSpeedRef</td><td>Forcing fan speed (S1, S2, S3). DRV switch SW3 = C (curtain).
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x06</td><td>CurtainHeatRef</td><td>Forcing T input. DRV switch SW3 = C (curtain).
<table><tr><th></th><th>Name</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x07</td><td>HeaterFanSpeedRef</td><td>Forcing fan speed (S1, S2, S3). DRV switch SW3 = H (heater).
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
</table>

<table>
<tr><td>0x08</td><td>HeaterHeatRef</td><td>Forcing T input. DRV switch SW3 = H (heater).

<table><tr><th></th><th>Name</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x09</td><td>Not used</td><td>Not used</td></tr>
<tr><td>0x0A</td><td>Tref</td><td>Target temperature.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0B</td><td>TLeadVal</td><td>Lead temperature sensor value.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0C</td><td>TLeadSensorSelect</td><td>Lead temperature sensor selection.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><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>DRV temperature sensor (T4 connector)</td></tr></table></td></tr>
<tr><td>0x0D</td><td>CurtainProgram</td><td>Curtain program setting.
<table><tr><th>Value</th><th>Setting</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0E</td><td>CurtainFanIdleRef</td><td>Stand-by fan operation for curtain.

AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
</table>

<table>
<tr><td>0x0F</td><td>HeaterFanIdleRef</td><td>Stand-by fan operation for heater.

AC Fan - 3 steps.

<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x10</td><td>FanIdleDelay</td><td>Time delay of stand-by fan operation.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0..65534</td><td>Delay in seconds</td></tr><tr><td>65535</td><td>Infinite</td></tr></table></td></tr>
<tr><td>0x11</td><td>ValveIdleDelay</td><td>Time delay of valve in stand-by fan operation.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0..65534</td><td>Delay in seconds</td></tr><tr><td>65535</td><td>Infinite</td></tr></table>
Condition:

ValveIdleDelay<FanIdleDelay.</td></tr>
<tr><td>0x12</td><td>AntifreezeWareHouseOn</td><td>Antifreeze work mode.

<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>WM_ON</td><td>ON</td></tr><tr><td>0x02</td><td>WM_OFF</td><td>OFF</td></tr></table></td></tr>
<tr><td>0x13</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable antifreeze.

<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
</table>

DRV-D

Chapter includes BMS information about destratification units from LEO D family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Work mode manual	0x04	WorkMode	0x04	Device starts ventilating (fan efficiency - high).
	0x05	FanEffRef	100	Check temperature sensors, fuse otherwise.
	0x0B	WorkModeTempRef	50	

Single mode using T-BOX as a gate:

DRV-D 20 (physical address set on a PCB board)

Address shift for device no. 20 → 0x05C0 (Input Register 0x24 from System settings - _Input Registers)

Mode	Shifted address	Set value
Work mode manual	0x05C4 (0x04+0x05C0)	0x04
	0x05C5 (0x05+0x05C0)	100
	0x05CB (0x0B+0x05C0)	50

Input Registers DRV-D

DATA:

(READ ONLY)

Address	Name	Description
0x04	T3	Temperature measured by T3 sensor (temperature measured near the celling). **Value** / **Temperature** / **Description** -350 / -35,0 / Minimal value 350 / 35,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected
0x05	T4	Temperature measured by T4 sensor (temperature measured in the room). **Value** / **Temperature** / **Description** -350 / 35,0 / Minimal value 350 / 35,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected
0x06	FanEff	Fan speed (S1, S2, S3). AC Fan - 3 steps. **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
0x07	DestStatus	Desertification condition. **Value** / **Description** 0x01 / Condition (destTemp > Td - Tm) and (Tz > Tm) not met 0x02 / Condition (destTemp > Td - Tm) and (Tz > Tm) met Tz - target room temperature (Tref) Td - temperature measured near the celling (T3 sensor), Tm - temperature measured in the room (TLeadVal or T4 sensor - depends on TleadSensorSelect settings).

<table>
<tr>
<td>0x08</td>
<td>FuseState</td>
<td>Fuse state for 3V fans, information can be read from 4 bits (11..8 bit).

<table>
<tr><th>Value 11..8 bit</th><th>Description</th></tr>
<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>
</table>

Example:

Fuse state 3V fan: working (0x1)

Register value: 0x0010

Fuse state 3V fan: blown (0x2)

Register value: 0x0020</td>
</tr>
</table>

Holding Registers DRV-D

DATA:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th></th><th>Work state</th><th>Description</th></tr><tr><td>1</td><td>WM_OFF</td><td>Desertification off</td></tr><tr><td>2</td><td>WM_AUTO_DEPEND</td><td>Work mode AUTO</td></tr><tr><td>3</td><td>WM_AUTO_INDEPEND</td><td>Work mode AUTO</td></tr><tr><td>4</td><td>WM_MANUAL</td><td>Work mode MANUAL</td></tr></table></td></tr>
<tr><td>0x05</td><td>FanEffRef</td><td>AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x06</td><td>Tref</td><td>Target temperature.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x07</td><td>TLeadVal</td><td>Lead temperature sensor value.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x08</td><td>TLeadSensorSelect</td><td>Lead temperature sensor selection.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><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>DRV temperature sensor (T4 connector)</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x0A</td>
<td>DestTempRef</td>
<td>Forcing desertification mode.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0</td><td>0,0</td><td>Minimal value</td></tr><tr><td>100</td><td>10,0</td><td>Maximal value</td></tr></table>
Condition:
DestTempRef > Td - Tm
Td - temperature measured near the celling (T3 sensor),
Tm - temperature measured in the room (TLeadVal or T4 sensor - depends on TleadSensorSelect settings).</td>
</tr>
<tr>
<td>0x0B</td>
<td>WorkModeTempRef</td>
<td>Target temperature value near the celling in manual mode. Condition WorkModeTempRef > Leading sensor value.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td>
</tr>
</table>

DRV-KM

Chapter includes BMS information about mixing chamber units from LEO KM family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Heating mode	0x04	WorkMode	0x02	Device starts heating (fan efficiency - low / 10%, opening valve actuator)
	0x0B	FenEffRef	10	target temperature to attain 40°C.
	0x0D	Tref	400	Check temperature sensors, fuse, thermostat otherwise.

Single mode using T-BOX as a gate:

DRV-KM 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
Heating mode	0x0344 (0x04+0x0340)	0x02
	0x034B (0x0B+0x0340)	10
	0x034D (0x0D+0x0340)	400

Holding Registers DRV-KM

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><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_HT</td><td>Heat mode</td></tr><tr><td>3</td><td>WM_COOL</td><td>Cool mode</td></tr><tr><td>4</td><td>WM_VENT</td><td>Ventilation mode</td></tr></table></td></tr>
<tr><td>0x05</td><td>AntiFreezeWareHouseOn</td><td>Enables/disables warehouse antifreeze mode.
1 - disable
2 - enable</td></tr>
<tr><td>0x06</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable warehouse antifreeze.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x07</td><td>DamperForceMode</td><td>Damper forcing mode.
<table><tr><th>Value</th><th>Work mode</th><th>Description</th></tr><tr><td>0</td><td>DAMPER_FMD_NS</td><td>Read only</td></tr><tr><td>1</td><td>DAMPER_FMD_OFF</td><td>Forcing mode off</td></tr><tr><td>2</td><td>DAMPER_FMD_ ON</td><td>Depends on air draw temperature:
if (T1 < DamperForceTempRef)
{
DamperLevelRef = DamperForceRef;
}</td></tr></table></td></tr>
<tr><td>0x08</td><td>DamperForceTempRef</td><td>Target temperature to force damper (work mode DamperForceMode == DAMPER_FMD_ON).
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><tr><td>-100</td><td>-10,0</td><td>Minimal value</td></tr><tr><td>150</td><td>15,0</td><td>Maximal value</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x09</td><td>DamperForceLevelRef</td><td>Damper position (work mode DamperMode == DAMPER_FMD_ ON) condition: Temp < DamperForceTempRef

<table><tr><th>Value</th><th>Damper airflow regulation [%]</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0A</td><td>DamperLevelRef</td><td>Damper position.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0B</td><td>FenEffRef</td><td>Fan efficiency setting.
EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table>AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0C</td><td>FanRoofForceEffRef</td><td>Forcing fan roof ventilator speed (efficiency will be increased by FanRoofForceEffRef).
<table><tr><th>Value %</th><th>Description</th></tr><tr><td>-10</td><td>Minimal value</td></tr><tr><td>10</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0D</td><td>Tref</td><td>Target temperature.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
</table>

<table>
<tr><td>0x0E</td><td>TLeadVal</td><td>Lead temperature sensor value.<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0F</td><td>TLeadSensorSelect</td><td>Leading sensor select.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>TSL_TNS</td><td>Read only</td></tr><tr><td>0x01</td><td>TSL_TLEAD</td><td>Temperature value transmitted via Modbus.</td></tr><tr><td>0x03</td><td>TSL_T4</td><td>Temperature measured by T4 sensor (air before water heat exchanger).</td></tr></table></td></tr>
<tr><td>0x10</td><td>FanRoofMode</td><td>Fan roof work mode.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>FR_MD_NS</td><td>Ready only</td></tr><tr><td>0x01</td><td>FR_MD_01</td><td>Depends on damper position (DamperLevelRef) and fan efficiency settings (FanEffRef)</td></tr><tr><td>0x02</td><td>FR_MD_02</td><td>Depends on damper position (DamperLevelRef)</td></tr></table></td></tr>
<tr><td>0x11</td><td>FilterTimeCntRst</td><td>Filter time reset.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>FLT_CNT_RST_NS</td><td>Read only - set after filter reset</td></tr><tr><td>0x01</td><td>FLT_CNT_RST</td><td>Filter time reset. (FilterWorkTime in Input Registers is set to 0)</td></tr></table></td></tr>
<tr><td>0x12</td><td>ThermostatModeState</td><td>Enable/disable thermostat mode.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>THERMO_MD_ON</td><td>Thermostat mode enabled</td></tr><tr><td>0x02</td><td>THERMO_MD_OFF</td><td>Thermostat mode disabled</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x13</td>
<td>ThermostatModeFanEffRef</td>
<td>Fan efficiency setting for thermostat mode.

EC Fan - speed variable in range 0 - 100%

<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table>

AC Fan - 3 steps.

<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
</table>

Input Registers DRV-KM

DATA:

(READ ONLY)

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>T1</td><td>Temperature measured by T1 sensor (fresh air temperature).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x05</td><td>T3</td><td>Temperature measured by T3 sensor (air after water heat exchanger).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x06</td><td>T4</td><td>Temperature measured by T4 sensor (air before water heat exchanger).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x07</td><td>T5</td><td>Temperature measured by T5 sensor (water exchanger temperature).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x08</td><td>ExternalGasDetect_TH1</td><td>External gas detector signal - first threshold.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below first threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds first threshold</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x09</td><td>ExternalGasDetect_TH2</td><td>External gas detector signal - second threshold.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below second threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds second threshold</td></tr></table></td></tr>
<tr><td>0x0A</td><td>ExternalGasDetect_val</td><td>Gas concentration value - 0-10V DC input (gas detector scaling information required).
<table><tr><th>Value</th><th>Voltage</th><th>Description</th></tr><tr><td>0</td><td>0,0</td><td>Minimal value</td></tr><tr><td>100</td><td>10,0</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0B</td><td>FanRoof_TK</td><td>TK signal from fan roof.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Temperature below safe limit.</td></tr><tr><td>0x02</td><td>Temperature above safe limit.</td></tr></table></td></tr>
<tr><td>0x0C</td><td>FanEff</td><td>Fan efficiency.
EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table>AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0D</td><td>FanUvoEff</td><td>Roof fan efficiency.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0E</td><td>DamperLevel</td><td>Damper position.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0F</td><td>DamperForceState</td><td>Forcing state for damper in mode DamperForceMode == DAMPER_FMD_ON
<table><tr><th>Value</th><th>Condition</th></tr><tr><td>0x01</td><td>Temp >= DamperForceTempRef</td></tr><tr><td>0x02</td><td>Temp < DamperForceTempRef</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x10</td><td>AntiFreezeState</td><td>Information about antifreeze (8 bits for respected mode).<table><tr><th>Value 15...8</th><th>Value 7..0 bit</th><th>Antifreeze</th><th>Description</th></tr><tr><td>-</td><td>0x01</td><td>Warehouse</td><td>Normal work mode</td></tr><tr><td>-</td><td>0x02</td><td>Warehouse</td><td>Antifreeze enabled (user parameters overwritten)</td></tr><tr><td>0x01</td><td>-</td><td>Water Exchanger</td><td>Normal work mode</td></tr><tr><td>0x02</td><td>-</td><td>Water Exchanger</td><td>Antifreeze enabled (user parameters overwritten)</td></tr></table></td></tr>
<tr><td>0x11</td><td>FilterWorkTime</td><td>Filter work time.

FilterWorkTime = 5 * FilterWorkTime (min)<table><tr><th>Value</th><th>Work time (min)</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>65535</td><td>5*65535</td><td>Maximal Value</td></tr></table></td></tr>
<tr><td>0x12</td><td>FilterPreasureSwitchState</td><td>Filter pressure state.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Not connected</td></tr><tr><td>0x01</td><td>Connected - good condition</td></tr><tr><td>0x02</td><td>Connected - bad condition</td></tr></table></td></tr>
<tr><td>0x13</td><td>FanEcConnect</td><td>Information about EC Fan connection.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Not connected</td></tr><tr><td>0x02</td><td>Connected</td></tr></table></td></tr>
<tr><td>0x14</td><td>FuseState</td><td>Fuse state for EC/3V/Roof fans, information can be read from 4 bits.<table><tr><th>Bits</th><th>Description</th></tr><tr><td>3..0</td><td>Roof fan</td></tr><tr><td>4..7</td><td>EC fan</td></tr><tr><td>8...11</td><td>3V fan</td></tr></table><table><tr><th>Value</th><th>Description</th></tr><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></table>Example:

Fuse state 3V fan: working (0x1)
Register value: 0x0010
Fuse state 3V fan: blown (0x2)
Register value: 0x0020</td></tr>
</table>

<table>
<tr>
<td>0x15</td>
<td>ValveState</td>
<td>Valve state.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
</table>

DRV-M&V

Chapter includes BMS information about heat units from LEO M&V family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Ventilation	0x04	WorkMode	0x06	Device starts ventilating (fan efficiency - med / 50%).
	0x07	FanEffRef	50	Check temperature sensors, fuse otherwise.
Manual heating	0x04	WorkMode	0x03	Device starts heating (fan efficiency - low / 20%, opening valve actuator)
	0x07	FanEffRef	20	target temperature to attain = 40°C.
	0x08	Tref	400	Check temperature sensors, fuse otherwise.

Single mode using T-BOX as a gate:

DRV-V/M 31 (physical address set on a PCB board)

Address shift for device no. 31 → 0x0880(Input Register 0x2F from System settings - _Input Registers)

Mode	Shifted address	Set value
Manual heating	0x0884 (0x04+0x0880)	0x03
	0x0887 (0x07+0x0880)	20
	0x0888 (0x08+0x0880)	400

Holding Registers DRV-M&V

DATA:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th>Value</th><th>Work state</th><th>Description</th></tr><tr><td>0</td><td>WM_DEF</td><td>Default value after power reset</td></tr><tr><td>1</td><td>WM_OFF</td><td>Device off</td></tr><tr><td>2</td><td>WM_HT_AUTO</td><td>Automatic heating</td></tr><tr><td>3</td><td>WM_HT_MANUAL</td><td>Manual heating</td></tr><tr><td>4</td><td>WM_COOL_AUTO</td><td>Automatic cooling</td></tr><tr><td>5</td><td>WM_COOL_MANUAL</td><td>Manual cooling</td></tr><tr><td>6</td><td>WM_VENT</td><td>Ventilation</td></tr></table></td></tr>
<tr><td>0x05</td><td>AntifreezeWareHouseOn</td><td>Antifreeze work mode.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>WM_ON</td><td>ON</td></tr><tr><td>0x02</td><td>WM_OFF</td><td>OFF</td></tr></table></td></tr>
<tr><td>0x06</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable antifreeze.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x07</td><td>FanEffRef</td><td>Fan efficiency setting.
EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table>
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
</table>

<table>
<tr><td>0x08</td><td>Tref</td><td>Target temperature.<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x09</td><td>TLeadVal</td><td>Lead temperature sensor value.<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0A</td><td>TleadSensorSelect</td><td><table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>TSL_TNS</td><td>Read only</td></tr><tr><td>0x01</td><td>TSL_TLEAD</td><td>Temperature value transmitted via Modbus</td></tr><tr><td>0x03</td><td>TSL_T4</td><td>Temperature measured by T4 sensor (air before water heat exchanger)</td></tr></table></td></tr>
<tr><td>0x0B</td><td>DestModeForce</td><td>Forcing destratification mode for destratificator<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>DEST_MDF_OFF</td><td>Turn Off</td></tr><tr><td>0x02</td><td>DEST_MDF_ON</td><td>Turn On</td></tr></table></td></tr>
<tr><td>0x0C</td><td>DestMode</td><td>Destratification work mode.<table><tr><th>Value</th><th>Destratification work mode</th><th>Description</th></tr><tr><td>1</td><td>DEST_MD_OFF</td><td>Off</td></tr><tr><td>2</td><td>DEST_MD_AUTO_DEPEND</td><td>Work mode AUTO</td></tr><tr><td>3</td><td>DEST_MD_AUTO_INDEPEND</td><td>Work mode AUTO</td></tr></table></td></tr>
<tr><td>0x0D</td><td>DestTempRef</td><td>Target value for lunching desertification mode.<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>0</td><td>0,0</td><td>Minimal value</td></tr><tr><td>50</td><td>5,0</td><td>Default value</td></tr><tr><td>100</td><td>10,0</td><td>Maximal value</td></tr></table>Condition:
DestTempRef > Td – Tm
Td – temperature value measured near desertificator (T3 sensor).
Tm – temperature value measured in the room (TLeadVal or T4 - depends on the TleadSensorSelect register value).</td></tr>
<tr><td>0x0E</td><td>DestStratTimeDelay</td><td>Not in use.</td></tr>
</table>

<table>
<tr>
<td>0x0F</td>
<td>ModeAuto_FanEffRefMin</td>
<td>Minimal fan efficiency in AUTO mode.

EC Fan - speed variable in range 0 - 100%

<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x10</td>
<td>ModeAuto_FanEffRefMax</td>
<td>Maximal fan efficiency in AUTO mode.

EC Fan - speed variable in range 0 - 100%

<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x11</td>
<td>ModeManual_FanEffRef</td>
<td>Fan efficiency after attaining target temperature in MANUAL mode.

EC Fan - speed variable in range 0 - 100%

<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
</table>

Input Registers DRV-M&V

DATA:

(READ ONLY)

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>T3</td><td>Temperature measured by T3 sensor (air after water heat exchanger).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x05</td><td>T4</td><td>Temperature measured by T4 sensor (air before water heat exchanger).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x06</td><td>FanEff</td><td>EC Fan - Revolutions per minute (rpm).
<table><tr><th>Value [rpm]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>3000</td><td>Maximal value</td></tr></table>AC Fan - 3 steps.<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x07</td><td>AntifreezeeState</td><td>Information about antifreeze (8 bits for respected mode).
<table><tr><th>Value 15..8 bit</th><th>Value 7..0 bit</th><th>Antifreeze</th><th>Description</th></tr><tr><td>-</td><td>0x01</td><td>Warehouse</td><td>Normal work mode.</td></tr><tr><td>-</td><td>0x02</td><td>Warehouse</td><td>Antifreeze enabled (user parameters overwritten).</td></tr><tr><td>0x01</td><td>-</td><td>Water Exchanger</td><td>Normal work mode.</td></tr><tr><td>0x02</td><td>-</td><td>Water Exchanger</td><td>Antifreeze enabled (user parameters overwritten).</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x08</td><td>DestStatus</td><td>Destratification status:
(destDtemp > Td - Tm) and (Tz >Tm)
Tz-room setting temp. (value from Tref register)
Td-temp. measured at destratificator (temp. value from T3 sensor)
Tm-temp. measured into room (value from TLeadVal or T4 - depending on settings in TleadSensorSelect register)
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Condition (destDtemp > Td - Tm) and (Tz >Tm) not fullfilled</td></tr><tr><td>0x02</td><td>Condition (destDtemp > Td - Tm) and (Tz >Tm) fullfilled</td></tr></table></td></tr>
<tr><td>0x09</td><td>FanEcConnect</td><td>EC Fan and DRV M connection status.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Fan not connected</td></tr><tr><td>0x02</td><td>Fan connected</td></tr></table></td></tr>
<tr><td>0x0A</td><td>FuseState</td><td>Fuse state for EC/3V/Roof fans, information can be read from 4 bits.
<table><tr><th>Bit</th><th>Description</th></tr><tr><td>3..0</td><td>Roof fan</td></tr><tr><td>4..7</td><td>EC fan</td></tr><tr><td>8...11</td><td>3V fan</td></tr></table><table><tr><th>Value</th><th>Description</th></tr><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></table>Example:
Fuse state 3V fan: working (0x1)
Register value: 0x0010
Fuse state 3V fan: blown (0x2)
Register value: 0x0020</td></tr>
<tr><td>0x0B</td><td>ValveState</td><td>Valve state.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><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></table></td></tr>
</table>

DRV-OXEN

Chapter includes BMS information about ventilation units from OXEN family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Ventilation	0x02	FanEffRef_1	100	Device starts ventilating (fan efficiency - 100%).
	0x03	FanEffRef_2	100	Check temperature sensors, fuse, antifreeze otherwise.
	0x04	OxenState	3	

Single mode using T-BOX as a gate:

DRV-OXEN 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	Set value
Ventilation	0x0342 (0x02+0x0340)	100
	0x0343 (0x03+0x0340)	100
	0x0344 (0x04+0x0340)	3

Holding Registers DRV-OXEN

DATA:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>Config1</td><td>Configuration register no. 1.
<table>
<tr><th>BIT</th><th>Name</th><th>Description</th></tr>
<tr><td>0</td><td>Filter work time RST</td><td>Filter work time reset.
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0x00</td><td>Place holder.</td></tr>
<tr><td>0x01</td><td>Reset filter counter (Sets address 0x09 to 0x000).</td></tr>
</table></td></tr>
<tr><td>2..15</td><td>-</td><td>Not used.</td></tr>
</table></td></tr>
<tr><td>0x01</td><td>Config2</td><td>Not used.</td></tr>
<tr><td>0x02</td><td>FanEffRef_1</td><td>Fan efficiency setting in group I (supply fans).
EC Fan - speed variable in range 0 - 100%
<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table></td></tr>
<tr><td>0x03</td><td>FanEffRef_2</td><td>Fan efficiency setting in group II (exhaust fans).
EC Fan - speed variable in range 0 - 100%
<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table></td></tr>
<tr><td>0x04</td><td>OxenState</td><td>Work state.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0</td><td>OX_OFF</td><td>Oxen off</td></tr>
<tr><td>1</td><td>OX_ON</td><td>Oxen on</td></tr>
<tr><td>2</td><td>OX_ON</td><td>Oxen on</td></tr>
<tr><td>3</td><td>OX_ON</td><td>Oxen on</td></tr>
</table></td></tr>
<tr><td>0x05</td><td>OxenMode</td><td>Work mode.</td></tr>
<tr><td>0x06</td><td>TempRef</td><td>Target temperature.
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<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>
</table></td></tr>
</table>

<table>
<tr><td>0x07</td><td>TLeadVal</td><td>Lead temperature sensor value.<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal Value</td></tr><tr><td>1500</td><td>150,0</td><td>Maximal Value</td></tr></table></td></tr>
<tr><td>0x08</td><td>TempIn</td><td>Not used.</td></tr>
<tr><td>0x09</td><td>TempOut</td><td>Not used.</td></tr>
<tr><td>0x0A</td><td>RegParam_K</td><td>Not used.</td></tr>
<tr><td>0x0B</td><td>RegParam_T</td><td>Not used.</td></tr>
<tr><td>0x0C</td><td>TleadSensorSelect</td><td>Lead temperature sensor selection.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>T_NS</td><td>Read only</td></tr><tr><td>0x01</td><td>T_LEAD</td><td>Value sent by ModBus (TLeadVal)</td></tr><tr><td>0x02</td><td>TSL_T3</td><td>DRV temperature sensor (T3 connector)</td></tr><tr><td>0x03</td><td>TSL_T4</td><td>DRV temperature sensor (T4 connector)</td></tr></table></td></tr>
<tr><td>0x0D</td><td>OxenElectricWorkMode</td><td>Not used.</td></tr>
<tr><td>0x0E</td><td>OxenElectricPtcPower_ref</td><td>Not used.</td></tr>
<tr><td>0x0F</td><td>PtcRegTempLow</td><td>Not used.</td></tr>
<tr><td>0x10</td><td>PtcRegTempHi</td><td>Not used.</td></tr>
</table>

Input Registers DRV-OXEN

DATA:

(READ ONLY)

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>Staus1</td><td>Status register no 1.
<table>
<tr><th>BIT</th><th>Name</th><th>Description</th></tr>
<tr><td>0..3</td><td>WorkMode</td><td>Oxen work mode.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>IDLE</td><td>Initial value after supplying voltage</td></tr>
<tr><td>0x01</td><td>INIT</td><td>Oxen initialization</td></tr>
<tr><td>0x02</td><td>READY</td><td>Oxen ready</td></tr>
</table></td></tr>
<tr><td>4..5</td><td>OxenType</td><td>Oxen Type.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>NONE</td><td>Type not identified</td></tr>
<tr><td>0x01</td><td>COLD</td><td>Cold OXEN</td></tr>
<tr><td>0x02</td><td>ELECTRIC</td><td>Electric OXEN</td></tr>
<tr><td>0x03</td><td>HOT</td><td>Water OXEN</td></tr>
</table></td></tr>
<tr><td>6..7</td><td>AfWaterEx</td><td>Water exchanger antifreeze information.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>OFF</td><td>Normal work mode</td></tr>
<tr><td>0x01</td><td>ON</td><td>Antifreeze enabled (user parameters overwritten)</td></tr>
</table></td></tr>
<tr><td>8 .. 9</td><td>AfHeatCrossEx</td><td>Heat cross exchanger antifreeze information.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>OFF</td><td>Normal work mode</td></tr>
<tr><td>0x01</td><td>ON</td><td>Antifreeze enabled (user parameters overwritten)</td></tr>
</table></td></tr>
<tr><td>10..15</td><td>-</td><td>Not used</td></tr>
</table></td></tr>
<tr><td>0x01</td><td>Status2</td><td>Not used.</td></tr>
</table>

<table>
<tr><td>0x02</td><td>T1</td><td>Temperature measured by T1 sensor (fresh air temperature).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x03</td><td>T2</td><td>Temperature measured by T2 sensor (air near fan extraction).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x04</td><td>T3</td><td>Temperature measured by T3 sensor (air after water heat exchanger).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x05</td><td>T4</td><td>Temperature measured by T4 sensor (air before water heat exchanger).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
</table>

<table>
<tr><td>0x06</td><td>T5</td><td>Temperature measured by T5 sensor (water exchanger temperature).

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x07</td><td>Outputs</td><td>Outputs status.
<table><tr><th>BIT</th><th>Name</th><th>Description</th></tr><tr><td>0</td><td>Damper</td><td>Damper state.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Closed</td></tr><tr><td>0x01</td><td>Opened</td></tr></table></td></tr><tr><td>1</td><td>Bypass</td><td>Bypass state.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Closed</td></tr><tr><td>0x01</td><td>Opened</td></tr></table></td></tr><tr><td>2..3</td><td>Valve</td><td>Valve state.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>IDLE</td><td>IDLE state (3-way valve)</td></tr><tr><td>0x01</td><td>OPEN</td><td>Opening valve</td></tr><tr><td>0x02</td><td>CLOSE</td><td>Closing valve</td></tr></table></td></tr><tr><td>4..15</td><td>-</td><td>Not used</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x08</td>
<td>Inputs</td>
<td>Inputs status.
<table>
<tr><th>BIT</th><th>Name</th><th>Description</th></tr>
<tr><td>0</td><td>NP_IN1</td><td>Non-potential input state IN1</td></tr>
<tr><td>1</td><td>NP_IN2</td><td>Non-potential input state IN2</td></tr>
<tr><td>2</td><td>NP_IN3</td><td>Non-potential input state IN3</td></tr>
<tr><td>3</td><td>SW1_P5</td><td>SW1 switch state, position 5</td></tr>
<tr><td>4</td><td>SW1_P4</td><td>SW1 switch state, position 4</td></tr>
<tr><td>5</td><td>SW1_P3</td><td>SW1 switch state, position 3</td></tr>
<tr><td>6</td><td>SW1_P2</td><td>SW1 switch state, position 2</td></tr>
<tr><td>7</td><td>SW1_P1</td><td>SW1 switch state, position 1</td></tr>
</table>
Non-potential inputs state:
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0</td><td>CLOSE</td><td>Short circuit</td></tr>
<tr><td>1</td><td>OPEN</td><td>Open</td></tr>
</table>
Switch states:
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0</td><td>OFF</td><td>Switch in OFF position</td></tr>
<tr><td>1</td><td>ON</td><td>Switch in ON position</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x09</td>
<td>FilterWorkTime</td>
<td>Filter work time.
<table>
<tr><th>Value</th><th>[min]</th><th>Description</th></tr>
<tr><td>0</td><td>5 * 0</td><td>Minimal value</td></tr>
<tr><td>65534</td><td>5 * 65534</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x0A</td>
<td>FansEff_1</td>
<td>Fan efficiency in group I (supply fans).
EC Fan - speed variable in range 0 - 100%
<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x0B</td>
<td>FansEff_2</td>
<td>Fan efficiency setting in group II (exhaust fans).
EC Fan - speed variable in range 0 - 100%
<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
</table>

0x0C	OxenElectric_PtcPower	Not used.
0x0D	OxenElectric_PtcTk	Not used

DRV-R

Chapter includes BMS information about gas heaters units from ROBUR family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Ventilation (summer)	0x04	WorkMode	0x02	Device starts ventilating. Check temperature sensors, fuse otherwise.
Heating mode (winter)	0x04	WorkMode	0x03	Device starts heating, target temperature to attain 40°C.
	0x0E	Tref	400	Check temperature sensors, fuse, thermostat, STB alarm otherwise.

Single mode using T-BOX as a gate:

DRV-R 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	Set value
Ventilation	0x0344 (0x04+0x0340)	0x02

Holding Registers DRV R

DATA:

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th>Value</th><th>Work state</th><th>Description</th></tr><tr><td>0x00</td><td>WM_NS</td><td>Read only</td></tr><tr><td>0x01</td><td>WM_OFF</td><td>Device off</td></tr><tr><td>0x02</td><td>WM_SUMMER</td><td>Summer mode (ventilation)</td></tr><tr><td>0x03</td><td>WM_WINTER_THERMO</td><td>Winter mode (heating), thermostatic mode</td></tr><tr><td>0x04</td><td>WM_WINTER_CONT</td><td>Winter mode (heating), continuous mode</td></tr></table></td></tr>
<tr><td>0x05</td><td>AntifreezeWareHouseOn</td><td>Enables/disables warehouse antifreeze mode.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>ON</td><td>Enable</td></tr><tr><td>0x02</td><td>OFF</td><td>Disable</td></tr></table></td></tr>
<tr><td>0x06</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable warehouse antifreeze.
<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>50</td><td>5,0</td><td>Minimal value</td></tr><tr><td>100</td><td>10,0</td><td>Default value</td></tr><tr><td>150</td><td>15,0</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0C</td><td>GasAlarmReset</td><td>Robur gas/flame alarm reset.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>RO</td><td>Read only</td></tr><tr><td>0x01</td><td>ON</td><td>Sending reset signal (continuously)</td></tr><tr><td>0x02</td><td>OFF</td><td>Stop sending reset signal</td></tr></table>Note: default reset time should not exceed 5 seconds (change the register to 0x02 afterwards).</td></tr>
<tr><td>0x0E</td><td>Tref</td><td>Target temperature.
<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>50</td><td>5,0</td><td>Minimal value</td></tr><tr><td>250</td><td>25,0</td><td>Default value</td></tr><tr><td>450</td><td>45,0</td><td>Maximal value</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x0F</td>
<td>TLeadVal

Data type: Signed Int16</td>
<td>Lead temperature sensor value.

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
<tr>
<td>0x10</td>
<td>TleadSensorSelect</td>
<td>Lead sensor select.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>TSL_TNS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>TSL_TLEAD</td><td>Temperature value transmitted via Modbus</td></tr>
<tr><td>0x03</td><td>TSL_T4</td><td>Temperature measured by T4 sensor (room temperature)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x12</td>
<td>STBTemperatureAlarmOn</td>
<td>Target temperature to invoke STB alarm state (Inpur Register 0x12).

Alarm occurs when set value is greater then T3 (Input Register 0x05)

Default value ensures error occurrence before real STB Robur alarm (which needs manual reset from heater control box).

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>810</td><td>81,0</td><td>Minimal value</td></tr>
<tr><td>900</td><td>90,0</td><td>Default value</td></tr>
<tr><td>1200</td><td>120,0</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x13</td>
<td>FilterTimeCntRst</td>
<td>Filter time reset.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>FLT_CNT_RST_NS</td><td>Read only - set after filter reset</td></tr>
<tr><td>0x01</td><td>FLT_CNT_RST</td><td>Filter time reset. (FilterWorkTime in Input Registers is set to 0)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x14</td>
<td>STBTemperatureAlarmOff</td>
<td>Target temperature to reset STB alarm state (Holding Register 0x0C).

Reset is possible If set value is greater then T3 (Input Register 0x05).

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>610</td><td>61,0</td><td>Minimal value</td></tr>
<tr><td>800</td><td>80,0</td><td>Maximal value</td></tr>
</table>

Additional condition:

STB_T_OFF < STB_T_REF</td>
</tr>
</table>

<table>
<tr>
<td>0x15</td>
<td>STBAlarmReset</td>
<td>STB Alarm reset.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x01</td><td>ON</td><td>Reset alarm on</td></tr>
<tr><td>0x02</td><td>OFF</td><td>Reset alarm off</td></tr>
</table>
If STB_T < STB_T_OFF register will be set to 0x02 (OFF)
STB_T - T3 (Input Register 0x03)
STB_T_OFF - STBTemperatureAlarmOff (Holding Register 0x14)</td>
</tr>
</table>

Input Registers DRV-R

DATA:

(READ ONLY)

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x05</td><td>T3
Data type: Signed Int16</td><td>Temperature measured by T3 sensor (air extraction temperature).
<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x06</td><td>T4
Data type: Signed Int16</td><td>Temperature measured by T4 sensor (room temperature).
<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x08</td><td>ExternalGasDetectTH1</td><td>External gas detector signal - first threshold.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds threshold</td></tr></table></td></tr>
<tr><td>0x09</td><td>ExternalGasDetectTH2</td><td>External gas detector signal - second threshold.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds threshold</td></tr></table></td></tr>
<tr><td>0x0A</td><td>ExternalGasDetectVal</td><td>Gas concentration value - 0-10V DC input (gas detector scaling information required).</td></tr>
<tr><td>0x0F</td><td>AntifreezeStateWarehouse</td><td>Information about warehouse antifreeze state.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Normal work mode</td></tr><tr><td>0x02</td><td>Antifreeze enabled (user parameters overwritten)</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x10</td><td>FuseState</td><td>Fan roof fuse state.<table><tr><th>Value</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x11</td><td>GasAlarmState</td><td>Robur alarm (gas/flame). Read from clamp no.6 (connection terminal inside Robur heater).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>ON</td><td>Alarm dected</td></tr><tr><td>0x02</td><td>OFF</td><td>No alarm</td></tr></table></td></tr>
<tr><td>0x12</td><td>STBAlarmState</td><td>Air extraction temperature alarm (STB).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>NC</td><td>PT1000 sensor not connected</td></tr><tr><td>0x01</td><td>ON</td><td>STB alarm detected (T3 >= T_STB_REF))</td></tr><tr><td>0x02</td><td>OFF</td><td>STB alarm not detected (T3 <= (T_STB_REF - 1 [K]))</td></tr></table></td></tr>
<tr><td>0x13</td><td>FilterWorkTime</td><td>Filter work time.
FilterWorkTime = 5 * FilterWorkTime (min)<table><tr><th>Value</th><th>Work time (min)</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>65535</td><td>5*65535</td><td>Maximal Value</td></tr></table></td></tr>
</table>

DRV-R KM

Chapter includes BMS information about robur mixing chambers units from ROBUR family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Ventilation (summer)	0x04	WorkMode	0x02	Device starts ventilating. Check temperature sensors, fuse otherwise.
Heating mode (winter)	0x04	WorkMode	0x03	Device starts heating, target temperature to attain 40°C.
	0x0E	Tref	400	Check temperature sensors, fuse, thermostat, STB alarm otherwise.

Single mode using T-BOX as a gate:

DRV-R KM 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	Set value
Ventilation (summer)	0x0344 (0x04+0x0340)	0x02

Holding Registers DRV-R KM

DATA:

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table>
<tr><th>Value</th><th>Work state</th><th>Description</th></tr>
<tr><td>0x00</td><td>WM_NS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>WM_OFF</td><td>Device off</td></tr>
<tr><td>0x02</td><td>WM_SUMMER</td><td>Summer mode (ventilation)</td></tr>
<tr><td>0x03</td><td>WM_WINTER_THERMO</td><td>Winter mode (heating), thermostatic mode</td></tr>
<tr><td>0x04</td><td>WM_WINTER_CONT</td><td>Winter mode (heating), continuous mode</td></tr>
</table></td></tr>
<tr><td>0x05</td><td>AntifreezeWareHouseOn</td><td>Enables/disables warehouse antifreeze mode.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x01</td><td>ON</td><td>Enable</td></tr>
<tr><td>0x02</td><td>OFF</td><td>Disable</td></tr>
</table></td></tr>
<tr><td>0x06</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable warehouse antifreeze.
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>50</td><td>5,0</td><td>Minimal value</td></tr>
<tr><td>100</td><td>10,0</td><td>Default value</td></tr>
<tr><td>150</td><td>15,0</td><td>Maximal value</td></tr>
</table></td></tr>
<tr><td>0x07</td><td>DamperForceMode</td><td>Damper forcing mode.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>DAMPER_FMD_NS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>DAMPER_FMD_OFF</td><td>Forcing mode off</td></tr>
<tr><td>0x02</td><td>DAMPER_FMD_ ON</td><td>Depends on air draw temperature:
if (T1 < DamperForceTempRef)
{
DamperLevelRef = DamperForceRef;
}</td></tr>
</table></td></tr>
<tr><td>0x08</td><td>DamperForceTempRef
Data type: Signed Int16</td><td>Target temperature to force damper (work mode DamperForceMode == DAMPER_FMD_ON).
Combined with T1 (fresh air temperature - Input Register 0x04).
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>-100</td><td>-10,0</td><td>Minimal value</td></tr>
<tr><td>0</td><td>0</td><td>Default value</td></tr>
<tr><td>150</td><td>15,0</td><td>Maximal value</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>0x09</td><td>DamperForceLevelRef</td><td>Target temperature value to open damper.
(work mode DamperMode == DAMPER_FMD_ ON) condition: Temp < DamperForceTempRef
<table><tr><th>Value</th><th>Damper airflow regulation [%]</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>10</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0A</td><td>DamperLevelRef</td><td>Damper position.
<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0B</td><td>DamperContLevelRef</td><td>Damper position when:
WorkMode == WM_WINTER_CONT.
<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0C</td><td>GasAlarmReset</td><td>Robur gas/flame alarm reset.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>RO</td><td>Read only</td></tr><tr><td>0x01</td><td>ON</td><td>Sending reset signal (continuously)</td></tr><tr><td>0x02</td><td>OFF</td><td>Stop sending reset signal</td></tr></table>Note: default reset time should not exceed 5 seconds (change the register to 0x02 afterwards).</td></tr>
<tr><td>0x0D</td><td>FanRoofForceEffRef</td><td>Forcing fan roof ventilator speed (efficiency will be increased by FanRoofForceEffRef).
<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>-100</td><td>Minimal value</td></tr><tr><td>0</td><td>Default value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0E</td><td>Tref</td><td>Target temperature.
<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>50</td><td>5,0</td><td>Minimal value</td></tr><tr><td>250</td><td>25,0</td><td>Default value</td></tr><tr><td>450</td><td>45,0</td><td>Maximal value</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x0F</td>
<td>TLeadVal

Data type: Signed Int16</td>
<td>Lead temperature sensor value.

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
<tr>
<td>0x10</td>
<td>TleadSensorSelect</td>
<td>Lead sensor select.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>TSL_TNS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>TSL_TLEAD</td><td>Temperature value transmitted via Modbus</td></tr>
<tr><td>0x03</td><td>TSL_T4</td><td>Temperature measured by T4 sensor (room temperature)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x11</td>
<td>FanRoofMode</td>
<td>Fan roof work mode.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>FR_MD_NS</td><td>Ready only</td></tr>
<tr><td>0x01</td><td>FR_MD_01</td><td>Depends on damper position (DamperLevelRef) and fan efficiency settings (FanEffRef)</td></tr>
<tr><td>0x02</td><td>FR_MD_02</td><td>Depends on damper position (DamperLevelRef)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x12</td>
<td>STBTemperatureAlarmOn</td>
<td>Target temperature to invoke STB alarm state (Inpur Register 0x12).

Alarm occurs when set value is greater then T3 (Input Register 0x05)

Default value ensures error occurrence before real STB Robur alarm (which needs manual reset from heater control box).

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>810</td><td>81,0</td><td>Minimal value</td></tr>
<tr><td>900</td><td>90,0</td><td>Default value</td></tr>
<tr><td>1200</td><td>120,0</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x13</td>
<td>FilterTimeCntRst</td>
<td>Filter time reset.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>FLT_CNT_RST_NS</td><td>Read only - set after filter reset</td></tr>
<tr><td>0x01</td><td>FLT_CNT_RST</td><td>Filter time reset. (FilterWorkTime in Input Registers is set to 0)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x14</td>
<td>STBTemperatureAlarmOff</td>
<td>Target temperature to reset STB alarm state (Holding Register 0x0C).

Reset is possible If set value is greater then T3 (Input Register 0x05).

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>610</td><td>61,0</td><td>Minimal value</td></tr>
<tr><td>800</td><td>80,0</td><td>Maximal value</td></tr>
</table>

Additional condition:

STB_T_OFF < STB_T_REF</td>
</tr>
</table>

<table>
<tr>
<td>0x15</td>
<td>STBAlarmReset</td>
<td>STB Alarm reset.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x01</td><td>ON</td><td>Reset alarm on</td></tr>
<tr><td>0x02</td><td>OFF</td><td>Reset alarm off</td></tr>
</table>
If STB_T < STB_T_OFF register will be set to 0x02 (OFF)
STB_T - T3 (Input Register 0x03)
STB_T_OFF - STBTemperatureAlarmOff (Holding Register 0x14)</td>
</tr>
</table>

Single Registers DRV-R KM

DATA:

(READ ONLY)

Address	Parameter	Description
0x04	T1 Data type: Signed Int16	Temperature measured by T1 sensor (fresh air temperature). **Value** / **Temperature [C]** / **Description** -500 / -50,0 / Minimal value 1000 / 100,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected
0x05	T3 Data type: Signed Int16	Temperature measured by T3 sensor (air extraction temperature). **Value** / **Temperature [C]** / **Description** -500 / -50,0 / Minimal value 1000 / 100,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected
0x06	T4 Data type: Signed Int16	Temperature measured by T4 sensor (room temperature). **Value** / **Temperature [C]** / **Description** -500 / -50,0 / Minimal value 1000 / 100,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected
0x07	T5 Data type: Signed Int16	Temperature measured by T5 sensor (not used in Robur devices). **Value** / **Temperature [C]** / **Description** -500 / -50,0 / Minimal value 1000 / 100,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected

<table>
<tr><td>0x08</td><td>ExternalGasDetectTH1</td><td>External gas detector signal - first threshold.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds threshold</td></tr></table></td></tr>
<tr><td>0x09</td><td>ExternalGasDetectTH2</td><td>External gas detector signal - second threshold.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds threshold</td></tr></table></td></tr>
<tr><td>0x0A</td><td>ExternalGasDetectVal</td><td>Gas concentration value - 0-10V DC input (gas detector scaling information required).</td></tr>
<tr><td>0x0B</td><td>FanRoofTK</td><td>Thermocontact signal from fan roof.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Temperature below safe limit</td></tr><tr><td>0x02</td><td>Temperature above safe limit</td></tr></table></td></tr>
<tr><td>0x0C</td><td>FanRoofEff</td><td>Roof fan efficiency.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0D</td><td>DamperLevel</td><td>Damper position.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0E</td><td>DamperForceState</td><td>Forcing state for damper in mode DamperForceMode == DAMPER_FMD_ON
<table><tr><th>Value</th><th>Condition</th></tr><tr><td>0x01</td><td>T4 >= DamperForceTempRef</td></tr><tr><td>0x02</td><td>T4 < DamperForceTempRef</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x0F</td><td>AntifreezeStateWarehouse</td><td>Information about warehouse antifreeze state.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Normal work mode</td></tr><tr><td>0x02</td><td>Antifreeze enabled (user parameters overwritten)</td></tr></table></td></tr>
<tr><td>0x10</td><td>FuseState</td><td>Fan roof fuse state.<table><tr><th>Value</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x11</td><td>GasAlarmState</td><td>Robur alarm (gas/flame). Read from clamp no.6 (connection terminal inside Robur heater).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>ON</td><td>Alarm dected</td></tr><tr><td>0x02</td><td>OFF</td><td>No alarm</td></tr></table></td></tr>
<tr><td>0x12</td><td>STBAlarmState</td><td>Air extraction temperature alarm (STB).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>NC</td><td>PT1000 sensor not connected</td></tr><tr><td>0x01</td><td>ON</td><td>STB alarm detected (T3 >= T_STB_REF))</td></tr><tr><td>0x02</td><td>OFF</td><td>STB alarm not detected (T3 <= (T_STB_REF - 1 [K]))</td></tr></table></td></tr>
<tr><td>0x13</td><td>FilterWorkTime</td><td>Filter work time.
FilterWorkTime = 5 * FilterWorkTime (min)<table><tr><th>Value</th><th>Work time (min)</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>65535</td><td>5*65535</td><td>Maximal Value</td></tr></table></td></tr>
</table>

DRV-EL

Chapter includes BMS information about electric heaters from LEO EL family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Ventilation	0x04	WorkMode	0x04	Device starts ventilating (fan efficiency - low).
	0x07	FanEffRef	33	Check temperature sensors, fuse, thermostat otherwise.
Manual Heating	0x04	WorkMode	0x03	Device starts heating (fan efficiency - low,
	0x07	FanEffRef	33	heating - first power setting) target temperature
	0x08	Tref	400	to attain 40°C.
	0x0F	ElectricHeaterPTCPower	0x02	Check temperature sensors, fuse, thermostat otherwise.

Single mode using T-BOX as a gate:

DRV-EL 12 (physical address set on a PCB board)

Address shift for device no. 12 → 0x03C0 (Input Register 0x1C from System settings - _Input Registers)

Mode	Shifted address	Set value
Ventilation	0x03C4 (0x04+0x03C0)	0x04
	0x03C7 (0x07+0x03C0)	33

Holding Register DRV-EL

DATA:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table>
<tr><th>Value</th><th>Work status</th><th>Description</th></tr>
<tr><td>0x00</td><td>WM_TS</td><td>TS</td></tr>
<tr><td>0x01</td><td>WM_OFF</td><td>Device off</td></tr>
<tr><td>0x02</td><td>WM_AUTO</td><td>Automatic mode</td></tr>
<tr><td>0x03</td><td>WM_HEAT</td><td>Manual heating</td></tr>
<tr><td>0x04</td><td>WM_VENT</td><td>Ventilation</td></tr>
<tr><td>0x05</td><td>WM_RAW</td><td>Raw.
Not used.</td></tr>
</table></td></tr>
<tr><td>0x05</td><td>AntifreezeWareHouseOn</td><td>Antifreeze work mode.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x01</td><td>WM_ON</td><td>ON</td></tr>
<tr><td>0x02</td><td>WM_OFF</td><td>OFF</td></tr>
</table></td></tr>
<tr><td>0x06</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable antifreeze.
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>50</td><td>5,0</td><td>Minimal value</td></tr>
<tr><td>100</td><td>10,0</td><td>Default value</td></tr>
<tr><td>150</td><td>15,0</td><td>Maximal value</td></tr>
</table></td></tr>
<tr><td>0x07</td><td>FanEffRef</td><td>Fan efficiency setting.
AC Fan - 3 steps.
<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>0x08</td><td>Tref</td><td>Target temperature.
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>50</td><td>5,0</td><td>Minimal value</td></tr>
<tr><td>250</td><td>25,0</td><td>Default value</td></tr>
<tr><td>450</td><td>45,0</td><td>Maximal value</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>0x09</td><td>TLeadVal

Data type: Signed Int16</td><td>Lead temperature sensor value.

<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0A</td><td>TleadSensorSelect</td><td>Lead sensor select.

<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>TSL_TNS</td><td>Read only</td></tr><tr><td>0x01</td><td>TSL_TLEAD</td><td>Temperature value transmitted via Modbus</td></tr><tr><td>0x03</td><td>TSL_T4</td><td>Temperature measured by T4 sensor (room temperature)</td></tr></table></td></tr>
<tr><td>0x0B</td><td>DestModeForce</td><td>Forcing destratification mode for destratificator.

<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>0x01</td><td>DEST_MDF_OFF</td><td>Turn off</td></tr><tr><td>0x02</td><td>DEST_MDF_ON</td><td>Turn on</td></tr></table></td></tr>
<tr><td>0x0C</td><td>DestMode</td><td>Destratification work mode.

<table><tr><th>Value</th><th>Destratification work mode</th><th>Description</th></tr><tr><td>1</td><td>DEST_MD_OFF</td><td>Off</td></tr><tr><td>2</td><td>DEST_MD_AUTO_DEPEND</td><td>Work mode AUTO</td></tr><tr><td>3</td><td>DEST_MD_AUTO_INDEPEND</td><td>Work mode AUTO</td></tr></table></td></tr>
<tr><td>0x0D</td><td>DestTempRef</td><td>Target value for lunching desertification mode.

<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>0</td><td>0,0</td><td>Minimal value</td></tr><tr><td>50</td><td>5,0</td><td>Default value</td></tr><tr><td>100</td><td>10,0</td><td>Maximal value</td></tr></table>
Condition:

DestTempRef > Td – Tm

Td – temperature value measured near desertificator (T3 sensor).

Tm – temperature value measured in the room (TLeadVal or T4 - depends on the TleadSensorSelect register value).</td></tr>
<tr><td>0x0E</td><td>DestStratTimeDelay</td><td>Not in use.</td></tr>
</table>

<table>
<tr>
<td>0x0F</td>
<td>ElectricHeaterPTCPower</td>
<td>Electric heater power for LEO EL L in manual heating work mode.

(SW3.5 = K1)

<table>
<tr><th>Value</th><th>L2 State</th><th>L1 State</th><th>Description</th></tr>
<tr><td>0x01</td><td>OFF</td><td>OFF</td><td>Off</td></tr>
<tr><td>0x02</td><td>OFF</td><td>ON</td><td>1 heat setting</td></tr>
<tr><td>0x03</td><td>ON</td><td>OFF</td><td>2 heat setting</td></tr>
<tr><td>0x04</td><td>ON</td><td>ON</td><td>3 heat setting</td></tr>
</table>

Electric heater power for LEO EL S in manual heating work mode.

(SW3.5 = K2)

<table>
<tr><th>Value</th><th>L2 State</th><th>L1 State</th><th>Description</th></tr>
<tr><td>0x01</td><td>OFF</td><td>OFF</td><td>Off</td></tr>
<tr><td>0x02</td><td>OFF</td><td>ON</td><td>1 heat setting</td></tr>
<tr><td>0x03</td><td>ON</td><td>ON</td><td>2 heat setting</td></tr>
<tr><td>0x04</td><td>ON</td><td>ON</td><td>2 heat setting</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x10</td>
<td>ModeAuto_FanEffRef</td>
<td>Fan efficiency after attaining target temperature in AUTO mode.

AC Fan - 3 steps.

<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
<tr>
<td>0x11</td>
<td>ModeManual_FanEffRef</td>
<td>Fan efficiency after attaining target temperature in MANUAL mode

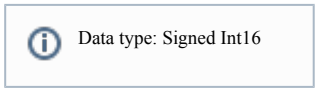
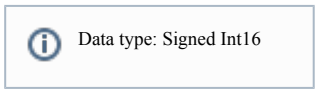
AC Fan - 3 steps.

<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
</table>

Inpur Register DRV-EL

(READ ONLY)

DATA:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>T3
 
Data type: Signed Int16</td><td>Temperature measured by T3 sensor (air near the celling).
<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x05</td><td>T4
 
Data type: Signed Int16</td><td>Temperature measured by T4 sensor (room temperature).
<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x06</td><td>FanEff</td><td>Fan efficiency.
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x07</td><td>AntifreezeeState</td><td>Information about antifreeze.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Normal work mode.</td></tr><tr><td>0x02</td><td>Antifreeze enabled (user parameters overwritten).</td></tr></table></td></tr>
<tr><td>0x08</td><td>DestStatus</td><td>Destratification status:
(destDtemp > Td - Tm) and (Tz >Tm)
Tz-room setting temp. (value from Tref register)
Td-temp. measured at destratificator (temp. value from T3 sensor)
Tm-temp. measured into room (value from TLeadVal or T4 - depending on settings in TleadSensorSelect register)
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Condition (destDtemp > Td - Tm) and (Tz >Tm) not fullfilled</td></tr><tr><td>0x02</td><td>Condition (destDtemp > Td - Tm) and (Tz >Tm) fullfilled</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x09</td>
<td>ThermalContactState</td>
<td>Thermal contact state.

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0x01</td><td>Overheat alarm</td></tr>
<tr><td>0x02</td><td>Normal work</td></tr>
</table>

IF 0x09 = 0x01 user parameters are overwritten:

• HR 0x07 FanEffRef = 100
• HR 0x0F ElectricHeaterPTCPower = 0

Overwrite discontinues when temperature inside the heater drops below safe limits.</td>
</tr>
<tr>
<td>0x0A</td>
<td>FuseState</td>
<td>Fuse state for EC/3V/Roof fans, information can be read from 4 bits.

<table>
<tr><th>Bit</th><th>Description</th></tr>
<tr><td>3..0</td><td>Roof fan</td></tr>
<tr><td>4..7</td><td>EC fan</td></tr>
<tr><td>8...11</td><td>3V fan</td></tr>
</table>

<table>
<tr><th>Value</th><th>Description</th></tr>
<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>
</table>

Example:

Fuse state 3V fan: working (0x1)

Register value: 0x0010

Fuse state 3V fan: blown (0x2)

Register value: 0x0020</td>
</tr>
<tr>
<td>0x0B</td>
<td>PTCHeaterPowerState</td>
<td>Electric heater power for LEO EL L in manual heating work mode.

(SW3.5 = K1)

<table>
<tr><th>Value</th><th>L2 State</th><th>L1 State</th><th>Description</th></tr>
<tr><td>0x01</td><td>OFF</td><td>OFF</td><td>Off</td></tr>
<tr><td>0x02</td><td>OFF</td><td>ON</td><td>1 heat setting</td></tr>
<tr><td>0x03</td><td>ON</td><td>OFF</td><td>2 heat setting</td></tr>
<tr><td>0x04</td><td>ON</td><td>ON</td><td>3 heat setting</td></tr>
</table>

Electric heater power for LEO EL S in manual heating work mode.

(SW3.5 = K2)

<table>
<tr><th>Value</th><th>L2 State</th><th>L1 State</th><th>Description</th></tr>
<tr><td>0x01</td><td>OFF</td><td>OFF</td><td>Off</td></tr>
<tr><td>0x02</td><td>OFF</td><td>ON</td><td>1 heat setting</td></tr>
<tr><td>0x03</td><td>ON</td><td>ON</td><td>2 heat setting</td></tr>
<tr><td>0x04</td><td>ON</td><td>ON</td><td>2 heat setting</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td>0x0C</td>
<td>ElectricHeaterType</td>
<td>Electric heater type.
<table>
<tr><th>Value</th><th>Description</th><th>SW3.5 position</th></tr>
<tr><td>0x01</td><td>2 heat steps (LEO EL S)</td><td>K2</td></tr>
<tr><td>0x02</td><td>3 heat steps (LEO EL L)</td><td>K1</td></tr>
</table>
SW3.5 - 5th pole of dip switch no. 3 (SW3 on PCB Board). Factory set compatible with device.
</td>
</tr>
</table>

DRV-R NEXT

Chapter includes BMS information about gas heaters units from ROBUR family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Ventilation (summer)	0x04	WorkMode	0x02	Device starts ventilating. Check temperature sensors, fuse otherwise.
Heating mode (winter)	0x04	WorkMode	0x03	Device starts heating, target temperature to attain 40°C.
	0x0E	Tref	400	Check temperature sensors, fuse, thermostat, STB alarm otherwise.

Single mode using T-BOX as a gate:

DRV-R 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	Set value
Ventilation	0x0344 (0x04+0x0340)	0x02

Holding Registers DRV-R NEXT

DATA:

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table>
<tr><th>Value</th><th>Work state</th><th>Description</th></tr>
<tr><td>0x00</td><td>WM_NS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>WM_OFF</td><td>Device off</td></tr>
<tr><td>0x02</td><td>WM_HEAT_AUTO</td><td>Automatic heating</td></tr>
<tr><td>0x03</td><td>WM_HEAT_MANUAL</td><td>Manual heating</td></tr>
<tr><td>0x04</td><td>WM_VENTILATION</td><td>Ventilation</td></tr>
</table></td></tr>
<tr><td>0x05</td><td>AntifreezeWareHouseOn</td><td>Enables/disables warehouse antifreeze mode.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x01</td><td>ON</td><td>Enable</td></tr>
<tr><td>0x02</td><td>OFF</td><td>Disable</td></tr>
</table></td></tr>
<tr><td>0x06</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable warehouse antifreeze.
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>50</td><td>5,0</td><td>Minimal value</td></tr>
<tr><td>100</td><td>10,0</td><td>Default value</td></tr>
<tr><td>150</td><td>15,0</td><td>Maximal value</td></tr>
</table></td></tr>
<tr><td>0x0C</td><td>GasAlarmReset</td><td>Robur gas/flame alarm reset.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>RO</td><td>Read only</td></tr>
<tr><td>0x01</td><td>ON</td><td>Sending reset signal (continuously)</td></tr>
<tr><td>0x02</td><td>OFF</td><td>Stop sending reset signal</td></tr>
</table>
Note: default reset time should not exceed 5 seconds (change the register to 0x02 afterwards).</td></tr>
<tr><td>0x0E</td><td>Tref</td><td>Target temperature.
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>50</td><td>5,0</td><td>Minimal value</td></tr>
<tr><td>250</td><td>25,0</td><td>Default value</td></tr>
<tr><td>450</td><td>45,0</td><td>Maximal value</td></tr>
</table></td></tr>
</table>

<table>
<tr>
<td>0x0F</td>
<td>TLeadVal

Data type: Signed Int16</td>
<td>Lead temperature sensor value.

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
<tr>
<td>0x10</td>
<td>TleadSensorSelect</td>
<td>Lead sensor select.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>TSL_TNS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>TSL_TLEAD</td><td>Temperature value transmitted via Modbus</td></tr>
<tr><td>0x03</td><td>TSL_T4</td><td>Temperature measured by T4 sensor (room temperature)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x12</td>
<td>STBTemperatureAlarmOn</td>
<td>Target temperature to invoke STB alarm state (Inpur Register 0x12).

Alarm occurs when set value is greater then T3 (Input Register 0x05)

Default value ensures error occurrence before real STB Robur alarm (which needs manual reset from heater control box).

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>810</td><td>81,0</td><td>Minimal value</td></tr>
<tr><td>900</td><td>90,0</td><td>Default value</td></tr>
<tr><td>1200</td><td>120,0</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x13</td>
<td>FilterTimeCntRst</td>
<td>Filter time reset.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>FLT_CNT_RST_NS</td><td>Read only - set after filter reset</td></tr>
<tr><td>0x01</td><td>FLT_CNT_RST</td><td>Filter time reset. (FilterWorkTime in Input Registers is set to 0)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x14</td>
<td>STBTemperatureAlarmOff</td>
<td>Target temperature to reset STB alarm state (Holding Register 0x0C).

Reset is possible If set value is greater then T3 (Input Register 0x05).

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>610</td><td>61,0</td><td>Minimal value</td></tr>
<tr><td>800</td><td>80,0</td><td>Maximal value</td></tr>
</table>

Additional condition:

STB_T_OFF < STB_T_REF</td>
</tr>
</table>

<table>
<tr>
<td>0x15</td>
<td>STBAlarmReset</td>
<td>STB Alarm reset.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>ON</td><td>Reset alarm on</td></tr><tr><td>0x02</td><td>OFF</td><td>Reset alarm off</td></tr></table>
If STB_T < STB_T_OFF register will be set to 0x02 (OFF)
STB_T - T3 (Input Register 0x03)
STB_T_OFF - STBTemperatureAlarmOff (Holding Register 0x14)</td>
</tr>
<tr>
<td>0x16</td>
<td>ContModeFanSpeedRef</td>
<td>Fan efficiency setting after attaining target temperature.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Read Only</td></tr><tr><td>0x01</td><td>Fan ON</td></tr><tr><td>0x02</td><td>Fan OFF</td></tr></table></td>
</tr>
<tr>
<td>0x17</td>
<td>GasBurnerLvlRef</td>
<td>Gas burning setting (valid for manual heating).
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Read Only</td></tr><tr><td>0x01</td><td>First step</td></tr><tr><td>0x02</td><td>Second step</td></tr></table></td>
</tr>
</table>

Input Registers DRV-R NEXT

DATA:

(READ ONLY)

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x05</td><td>T3
Data type: Signed Int16</td><td>Temperature measured by T3 sensor (air extraction temperature).<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x06</td><td>T4
Data type: Signed Int16</td><td>Temperature measured by T4 sensor (room temperature).<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>-500</td><td>-50,0</td><td>Minimal value</td></tr><tr><td>1000</td><td>100,0</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></table></td></tr>
<tr><td>0x08</td><td>ExternalGasDetectTH1</td><td>External gas detector signal - first threshold.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds threshold</td></tr></table></td></tr>
<tr><td>0x09</td><td>ExternalGasDetectTH2</td><td>External gas detector signal - second threshold.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds threshold</td></tr></table></td></tr>
<tr><td>0x0A</td><td>ExternalGasDetectVal</td><td>Gas concentration value - 0-10V DC input (gas detector scaling information required).</td></tr>
<tr><td>0x0F</td><td>AntifreezeStateWarehouse</td><td>Information about warehouse antifreeze state.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Normal work mode</td></tr><tr><td>0x02</td><td>Antifreeze enabled (user parameters overwritten)</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x10</td><td>FuseState</td><td>Fan roof fuse state.<table><tr><th>Value</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x11</td><td>GasAlarmState</td><td>Robur alarm (gas/flame). Read from clamp no.6 (connection terminal inside Robur heater).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>ON</td><td>Alarm dected</td></tr><tr><td>0x02</td><td>OFF</td><td>No alarm</td></tr></table></td></tr>
<tr><td>0x12</td><td>STBAlarmState</td><td>Air extraction temperature alarm (STB).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>NC</td><td>PT1000 sensor not connected</td></tr><tr><td>0x01</td><td>ON</td><td>STB alarm detected (T3 >= T_STB_REF))</td></tr><tr><td>0x02</td><td>OFF</td><td>STB alarm not detected (T3 <= (T_STB_REF - 1 [K]))</td></tr></table></td></tr>
<tr><td>0x13</td><td>FilterWorkTime</td><td>Filter work time.
FilterWorkTime = 5 * FilterWorkTime (min)<table><tr><th>Value</th><th>Work time (min)</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>65535</td><td>5*65535</td><td>Maximal Value</td></tr></table></td></tr>
</table>

DRV-R KM NEXT

Chapter includes BMS information about robur mixing chambers units from ROBUR family in single mode.

Quick Start in single mode:

Mode	Address (HR)	Name	Set value	Description
Ventilation (summer)	0x04	WorkMode	0x02	Device starts ventilating. Check temperature sensors, fuse otherwise.
Heating mode (winter)	0x04	WorkMode	0x03	Device starts heating, target temperature to attain 40°C.
	0x0E	Tref	400	Check temperature sensors, fuse, thermostat, STB alarm otherwise.

Single mode using T-BOX as a gate:

DRV-R KM 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	Set value
Ventilation (summer)	0x0344 (0x04+0x0340)	0x02

Holding Registers DRV-R KM NEXT

DATA:

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table>
<tr><th>Value</th><th>Work state</th><th>Description</th></tr>
<tr><td>0x00</td><td>WM_NS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>WM_OFF</td><td>Device off</td></tr>
<tr><td>0x02</td><td>WM_HEAT_AUTO</td><td>Automatic heating</td></tr>
<tr><td>0x03</td><td>WM_HEAT_MANUAL</td><td>Manual heating</td></tr>
<tr><td>0x04</td><td>WM_VENTILATION</td><td>Ventilation</td></tr>
</table></td></tr>
<tr><td>0x05</td><td>AntifreezeWareHouseOn</td><td>Enables/disables warehouse antifreeze mode.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x01</td><td>ON</td><td>Enable</td></tr>
<tr><td>0x02</td><td>OFF</td><td>Disable</td></tr>
</table></td></tr>
<tr><td>0x06</td><td>AntifreezeWareHouseTempRef</td><td>Target temperature to enable warehouse antifreeze.
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>50</td><td>5,0</td><td>Minimal value</td></tr>
<tr><td>100</td><td>10,0</td><td>Default value</td></tr>
<tr><td>150</td><td>15,0</td><td>Maximal value</td></tr>
</table></td></tr>
<tr><td>0x07</td><td>DamperForceMode</td><td>Damper forcing mode.
<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>DAMPER_FMD_NS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>DAMPER_FMD_OFF</td><td>Forcing mode off</td></tr>
<tr><td>0x02</td><td>DAMPER_FMD_ ON</td><td>Depends on air draw temperature:
if (T1 < DamperForceTempRef)
{
DamperLevelRef = DamperForceRef;
}</td></tr>
</table></td></tr>
<tr><td>0x08</td><td>DamperForceTempRef
Data type: Signed Int16</td><td>Target temperature to force damper (work mode DamperForceMode == DAMPER_FMD_ON).
Combined with T1 (fresh air temperature - Input Register 0x04).
<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>-100</td><td>-10,0</td><td>Minimal value</td></tr>
<tr><td>0</td><td>0</td><td>Default value</td></tr>
<tr><td>150</td><td>15,0</td><td>Maximal value</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>0x09</td><td>DamperForceLevelRef</td><td>Target temperature value to open damper.
(work mode DamperMode == DAMPER_FMD_ ON) condition: Temp < DamperForceTempRef
<table><tr><th>Value</th><th>Damper airflow regulation [%]</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>10</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0A</td><td>DamperLevelRef</td><td>Damper position.
<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0B</td><td>DamperContLevelRef</td><td>Damper position when:
WorkMode == WM_WINTER_CONT.
<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0C</td><td>GasAlarmReset</td><td>Robur gas/flame alarm reset.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>RO</td><td>Read only</td></tr><tr><td>0x01</td><td>ON</td><td>Sending reset signal (continuously)</td></tr><tr><td>0x02</td><td>OFF</td><td>Stop sending reset signal</td></tr></table>Note: default reset time should not exceed 5 seconds (change the register to 0x02 afterwards).</td></tr>
<tr><td>0x0D</td><td>FanRoofForceEffRef</td><td>Forcing fan roof ventilator speed (efficiency will be increased by FanRoofForceEffRef).
<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>-100</td><td>Minimal value</td></tr><tr><td>0</td><td>Default value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0E</td><td>Tref</td><td>Target temperature.
<table><tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr><tr><td>50</td><td>5,0</td><td>Minimal value</td></tr><tr><td>250</td><td>25,0</td><td>Default value</td></tr><tr><td>450</td><td>45,0</td><td>Maximal value</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x0F</td>
<td>TLeadVal

Data type: Signed Int16</td>
<td>Lead temperature sensor value.

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
<tr>
<td>0x10</td>
<td>TleadSensorSelect</td>
<td>Lead sensor select.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>TSL_TNS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>TSL_TLEAD</td><td>Temperature value transmitted via Modbus</td></tr>
<tr><td>0x03</td><td>TSL_T4</td><td>Temperature measured by T4 sensor (room temperature)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x11</td>
<td>FanRoofMode</td>
<td>Fan roof work mode.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>FR_MD_NS</td><td>Ready only</td></tr>
<tr><td>0x01</td><td>FR_MD_01</td><td>Depends on damper position (DamperLevelRef) and fan efficiency settings (FanEffRef)</td></tr>
<tr><td>0x02</td><td>FR_MD_02</td><td>Depends on damper position (DamperLevelRef)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x12</td>
<td>STBTemperatureAlarmOn</td>
<td>Target temperature to invoke STB alarm state (Inpur Register 0x12).

Alarm occurs when set value is greater then T3 (Input Register 0x05)

Default value ensures error occurrence before real STB Robur alarm (which needs manual reset from heater control box).

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>810</td><td>81,0</td><td>Minimal value</td></tr>
<tr><td>900</td><td>90,0</td><td>Default value</td></tr>
<tr><td>1200</td><td>120,0</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x13</td>
<td>FilterTimeCntRst</td>
<td>Filter time reset.

<table>
<tr><th>Value</th><th>Name</th><th>Description</th></tr>
<tr><td>0x00</td><td>FLT_CNT_RST_NS</td><td>Read only - set after filter reset</td></tr>
<tr><td>0x01</td><td>FLT_CNT_RST</td><td>Filter time reset. (FilterWorkTime in Input Registers is set to 0)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x14</td>
<td>STBTemperatureAlarmOff</td>
<td>Target temperature to reset STB alarm state (Holding Register 0x0C).

Reset is possible If set value is greater then T3 (Input Register 0x05).

<table>
<tr><th>Value</th><th>Temperature [C]</th><th>Description</th></tr>
<tr><td>610</td><td>61,0</td><td>Minimal value</td></tr>
<tr><td>800</td><td>80,0</td><td>Maximal value</td></tr>
</table>

Additional condition:

STB_T_OFF < STB_T_REF</td>
</tr>
</table>

<table>
<tr>
<td>0x15</td>
<td>STBAlarmReset</td>
<td>STB Alarm reset.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>ON</td><td>Reset alarm on</td></tr><tr><td>0x02</td><td>OFF</td><td>Reset alarm off</td></tr></table>
If STB_T < STB_T_OFF register will be set to 0x02 (OFF)
STB_T - T3 (Input Register 0x03)
STB_T_OFF - STBTemperatureAlarmOff (Holding Register 0x14)</td>
</tr>
<tr>
<td>0x16</td>
<td>ContModeFanSpeedRef</td>
<td>Fan efficiency setting after attaining target temperature.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Read Only</td></tr><tr><td>0x01</td><td>Fan ON</td></tr><tr><td>0x02</td><td>Fan OFF</td></tr></table></td>
</tr>
<tr>
<td>0x17</td>
<td>GasBurnerLvlRef</td>
<td>Gas burning setting (valid for manual heating).
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Read Only</td></tr><tr><td>0x01</td><td>First step</td></tr><tr><td>0x02</td><td>Second step</td></tr></table></td>
</tr>
</table>

Input Registers DRV-R KM NEXT

DATA:

(READ ONLY)

Address	Parameter	Description
0x04	T1 Data type: Signed Int16	Temperature measured by T1 sensor (fresh air temperature). **Value** / **Temperature [C]** / **Description** -500 / -50,0 / Minimal value 1000 / 100,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected
0x05	T3 Data type: Signed Int16	Temperature measured by T3 sensor (air extraction temperature). **Value** / **Temperature [C]** / **Description** -500 / -50,0 / Minimal value 1000 / 100,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected
0x06	T4 Data type: Signed Int16	Temperature measured by T4 sensor (room temperature). **Value** / **Temperature [C]** / **Description** -500 / -50,0 / Minimal value 1000 / 100,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected
0x07	T5 Data type: Signed Int16	Temperature measured by T5 sensor (not used in Robur devices). **Value** / **Temperature [C]** / **Description** -500 / -50,0 / Minimal value 1000 / 100,0 / Maximal value 0x7000 / - / Short circuit 0x7FFF / - / PT1000 sensor not connected

<table>
<tr><td>0x08</td><td>ExternalGasDetectTH1</td><td>External gas detector signal - first threshold.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds threshold</td></tr></table></td></tr>
<tr><td>0x09</td><td>ExternalGasDetectTH2</td><td>External gas detector signal - second threshold.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Gas concentration below threshold</td></tr><tr><td>0x01</td><td>Gas concentration exceeds threshold</td></tr></table></td></tr>
<tr><td>0x0A</td><td>ExternalGasDetectVal</td><td>Gas concentration value - 0-10V DC input (gas detector scaling information required).</td></tr>
<tr><td>0x0B</td><td>FanRoofTK</td><td>Thermocontact signal from fan roof.
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Temperature below safe limit</td></tr><tr><td>0x02</td><td>Temperature above safe limit</td></tr></table></td></tr>
<tr><td>0x0C</td><td>FanRoofEff</td><td>Roof fan efficiency.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0D</td><td>DamperLevel</td><td>Damper position.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0E</td><td>DamperForceState</td><td>Forcing state for damper in mode DamperForceMode == DAMPER_FMD_ON
<table><tr><th>Value</th><th>Condition</th></tr><tr><td>0x01</td><td>T4 >= DamperForceTempRef</td></tr><tr><td>0x02</td><td>T4 < DamperForceTempRef</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x0F</td><td>AntifreezeStateWarehouse</td><td>Information about warehouse antifreeze state.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Normal work mode</td></tr><tr><td>0x02</td><td>Antifreeze enabled (user parameters overwritten)</td></tr></table></td></tr>
<tr><td>0x10</td><td>FuseState</td><td>Fan roof fuse state.<table><tr><th>Value</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x11</td><td>GasAlarmState</td><td>Robur alarm (gas/flame). Read from clamp no.6 (connection terminal inside Robur heater).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x01</td><td>ON</td><td>Alarm dected</td></tr><tr><td>0x02</td><td>OFF</td><td>No alarm</td></tr></table></td></tr>
<tr><td>0x12</td><td>STBAlarmState</td><td>Air extraction temperature alarm (STB).<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>NC</td><td>PT1000 sensor not connected</td></tr><tr><td>0x01</td><td>ON</td><td>STB alarm detected (T3 >= T_STB_REF))</td></tr><tr><td>0x02</td><td>OFF</td><td>STB alarm not detected (T3 <= (T_STB_REF - 1 [K]))</td></tr></table></td></tr>
<tr><td>0x13</td><td>FilterWorkTime</td><td>Filter work time.
FilterWorkTime = 5 * FilterWorkTime (min)<table><tr><th>Value</th><th>Work time (min)</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>65535</td><td>5*65535</td><td>Maximal Value</td></tr></table></td></tr>
</table>

Device Groups

Modbus Holding Registers Header

Address	Name	Description
0x00	DrvGroup_Id	Group identifier. **Read only**
0x01	Zone_Id	Zone group identifier. **Read only**
0x02	Rsv	Reserved **Read only**
0x03	Rsv	Reserved **Read only**

Value	Zone	Description
0x01	Zone01	

This chapter is meant to be used with BMS work mode parameter set up to 0x02.

Indirect access to DRV settings via groups. T-Box settings are unblocked and can be freely modified by BMS. Group mean types of products connected to T-Box (Leo D, Leo V, Leo M, Leo KM, ELiS, DUO, OXeN). Every change in (for example) OXeN group will modify settings for all OXeN's connected to single T-Box.

Single driver settings are read only.

Every single device group controlled by T-Box is identified by group identifier.

GroupId

Value	Name	Description
0x00	Non	No DRV connected
0x01	GroupOxen	DRV - Oxen
0x02	GroupKm	DRV - KM
0x03	GroupElis	DRV - ELIS
0x04	GroupElisDuo	DRV - ELIS DUO
0x05	GroupLeoV	DRV - V
0x06	GroupLeoM	DRV - M
0x07	GroupLeoD	DRV - D
0x0C	GroupRobur	DRV-R
0x0D	GroupRoburKM	DRV-R-KM
0x0E	GroupLeoEL	DRV-EL

0x14	GroupLeoDEC	DRV-D EC
0x15	GroupRoburNext	DRV-ROBUR NEXT
0x16	GroupRoburNextKM	DRV-ROBUR NEXT KM

Group DRV-ELIS

Modbus Holding Registers

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode
<table><tr><th>Value</th><th>Work status</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x05</td><td>CurtainFanSpeedRef</td><td>Forcing fan speed (S1, S2, S3).
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x06</td><td>CurtainHeatRef</td><td>Forcing T input (only for curtain setup).
Read only</td></tr>
<tr><td>0x07</td><td>ContactDoor</td><td>Forcing DC input
Read only</td></tr>
<tr><td>0x08</td><td>CurtainProgram</td><td>Curtain program setting.
<table><tr><th>Value</th><th>Setting</th><th>Description</th></tr><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></table></td></tr>
</table>

<table>
<tr>
<td>0x09</td>
<td>CurtainFanIdleRef</td>
<td>Stand-by fan operation.
AC Fan - 3 steps.
<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
<tr>
<td>0x0A</td>
<td>FanIdleDelay</td>
<td>Time delay of stand-by fan operation.
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0..65534</td><td>Delay in seconds</td></tr>
<tr><td>65535</td><td>Infinite</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x0B</td>
<td>ValveIdleDelay</td>
<td>Time delay of valve in stand-by fan operation.
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0..65534</td><td>Delay in seconds</td></tr>
<tr><td>65535</td><td>Infinite</td></tr>
</table>
Condition:
ValveIdleDelay<FanIdleDelay</td>
</tr>
</table>

Group DRV-ELIS Duo

Modbus Holding Registers

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode
<table><tr><th>Value</th><th>Work status</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x05</td><td>CurtainFanSpeedRef</td><td>Forcing curtain fan speed (S1, S2, S3).
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x06</td><td>CurtainHeatRef</td><td>Forcing T input (only for curtain setup).
Read only</td></tr>
<tr><td>0x07</td><td>HeaterFanRef</td><td>Forcing heater fan speed (S1, S2, S3).
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x08</td><td>ContactDoor</td><td>Forcing DC input
Read only</td></tr>
</table>

<table>
<tr><td>0x09</td><td>CurtainProgram</td><td>Curtain program setting.<table><tr><th>Value</th><th>Setting</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0A</td><td>CurtainFanIdleRef</td><td>Stand-by fan operation (curtain).
AC Fan - 3 steps.<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0B</td><td>HeaterFanIdleRef</td><td>Stand-by fan operation (heater).
AC Fan - 3 steps.<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0C</td><td>FanIdleDelay</td><td>Time delay of stand-by fan operation.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0..65534</td><td>Delay in seconds</td></tr><tr><td>65535</td><td>Infinite</td></tr></table></td></tr>
<tr><td>0x0D</td><td>ValveIdleDelay</td><td>Time delay of valve in stand-by fan operation.<table><tr><th>Value</th><th>Description</th></tr><tr><td>0..65534</td><td>Delay in seconds</td></tr><tr><td>65535</td><td>Infinite</td></tr></table>Condition:
ValveIdleDelay<FanIdleDelay</td></tr>
</table>

Group DRV-D

Modbus Holding Registers

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th></th><th>Work state</th><th>Description</th></tr><tr><td>1</td><td>WM_OFF</td><td>Desertification off</td></tr><tr><td>2</td><td>WM_AUTO_DEPEND</td><td>Work mode AUTO</td></tr><tr><td>3</td><td>WM_AUTO_INDEPEND</td><td>Work mode AUTO</td></tr><tr><td>4</td><td>WM_MANUAL</td><td>Work mode MANUAL</td></tr></table></td></tr>
<tr><td>0x05</td><td>FanEffRef</td><td>Fan efficiency setting.
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x06</td><td>DestTempRef</td><td>Target value for lunching desertification mode.
<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>0</td><td>0,0</td><td>Minimal value</td></tr><tr><td>50</td><td>5,0</td><td>Default value</td></tr><tr><td>100</td><td>10,0</td><td>Maximal value</td></tr></table>
Condition:
DestTempRef > Td – Tm
Td – temperature value measured near desertificator (T3 sensor).
Tm – temperature value measured in the room (TLeadVal or T4 - depends on the TleadSensorSelect register value).</td></tr>
<tr><td>0x07</td><td>WorkModeTempRef</td><td>Target value for desertification in MANUAL mode.
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
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Group DRV-KM

Modbus Holding Registers

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode
<table><tr><th>Value</th><th>Work mode</th><th>Description</th></tr><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_HT</td><td>Heat mode</td></tr><tr><td>3</td><td>WM_COOL</td><td>Cool mode</td></tr><tr><td>4</td><td>WM_VENT</td><td>Ventilation mode</td></tr></table></td></tr>
<tr><td>0x05</td><td>DamperForceMode</td><td>Damper forcing mode.
<table><tr><th>Value</th><th>Work mode</th><th>Description</th></tr><tr><td>0</td><td>DAMPER_FMD_NS</td><td>Read only</td></tr><tr><td>1</td><td>DAMPER_FMD_OFF</td><td>Forcing mode off</td></tr><tr><td>2</td><td>DAMPER_FMD_ ON</td><td>Depends on air draw temperature:
if (T1 < DamperForceTempRef)
{
DamperLevelRef = DamperForceRef;
}</td></tr></table></td></tr>
<tr><td>0x06</td><td>DamperForceTempRef</td><td>Target temperature value to open damper in forcing mode.
(work mode DamperForceMode == DAMPER_FMD_ ON).
<table><tr><th>Value</th><th>Temperature</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x07</td><td>DamperForceLevelRef</td><td>Target temperature value to open damper. (work mode DamperMode == DAMPER_FMD_ ON) condition: Temp < DamperForceTempRef
<table><tr><th>Value</th><th>Damper airflow regulation [%]</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>100</td><td>Maximal value</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x08</td><td>DamperLevelRef</td><td>Damper settings:

<table><tr><th>Value</th><th>Damper airflow regulation [%]</th><th>Description</th></tr><tr><td>0</td><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x09</td><td>FanEffRef</td><td>Fan settings:

EC Fan - speed variable in range 0 - 100%

<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table>
AC Fan - 3 steps.

<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0A</td><td>FanRoofForceEffRef</td><td>Forcing fan roof efficiency (FanRoofForceEffRef will be added to FanEffRef).

<table><tr><th>Value</th><th>Fan efficiency</th><th>Description</th></tr><tr><td>-100</td><td>-100</td><td>Minimal value</td></tr><tr><td>100</td><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0B</td><td>FanRoofMode</td><td>Fan roof work mode.

<table><tr><th>Value</th><th>Work mode</th><th>Description</th></tr><tr><td>0</td><td>FR_MD_NS</td><td>Read only.</td></tr><tr><td>1</td><td>FR_MD_01</td><td>Fan roof efficiency depended on DamperLevelRef and FanEffRef.</td></tr><tr><td>2</td><td>FR_MD_02</td><td>Fan roof efficiency depended on DamperLevelRef.</td></tr></table></td></tr>
<tr><td>0x0C</td><td>ThermostatModeState</td><td>Thermostatic mode.

<table><tr><th>Value</th><th>Work mode</th><th>Description</th></tr><tr><td>1</td><td>THERMO_MD_ON</td><td>Thermostatic mode on</td></tr><tr><td>2</td><td>THERMO_MD_OFF</td><td>Thermostatic mode off</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x0D</td>
<td>ThermostatModeFanEffRef</td>
<td>Fan settings for thermostatic mode.

EC Fan - speed variable in range 0 - 100%

<table>
<tr><th>Value</th><th>Fan speed</th><th>Description</th></tr>
<tr><td>0</td><td>0%</td><td>Minimal value</td></tr>
<tr><td>100</td><td>100%</td><td>Maximal value</td></tr>
</table>

AC Fan - 3 steps.

<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table>
</td>
</tr>
</table>

Group DRV-M

Modbus Holding Registers

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th>Value</th><th>Work state</th><th>Description</th></tr><tr><td>0</td><td>WM_DEF</td><td>Default value after power reset</td></tr><tr><td>1</td><td>WM_OFF</td><td>Device off</td></tr><tr><td>2</td><td>WM_HT_AUTO</td><td>Automatic heating</td></tr><tr><td>3</td><td>WM_HT_MANUAL</td><td>Manual heating</td></tr><tr><td>4</td><td>WM_COOL_AUTO</td><td>Automatic cooling</td></tr><tr><td>5</td><td>WM_COOL_MANUAL</td><td>Manual cooling</td></tr><tr><td>6</td><td>WM_VENT</td><td>Ventilation</td></tr></table></td></tr>
<tr><td>0x05</td><td>FanEffRef</td><td>Fan efficiency setting.
EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x06</td><td>DestModeForce</td><td>Destratification work mode.
<table><tr><th>Value</th><th>Destratification work mode</th><th>Description</th></tr><tr><td>1</td><td>DEST_MD_OFF</td><td>Off</td></tr><tr><td>2</td><td>DEST_MD_AUTO_DEPEND</td><td>Work mode AUTO</td></tr><tr><td>3</td><td>DEST_MD_AUTO_INDEPEND</td><td>Work mode AUTO</td></tr></table></td></tr>
<tr><td>0x07</td><td>DestTempRef</td><td>Target value for lunching desertification mode.
<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>0</td><td>0,0</td><td>Minimal value</td></tr><tr><td>50</td><td>5,0</td><td>Default value</td></tr><tr><td>100</td><td>10,0</td><td>Maximal value</td></tr></table>
Condition:
DestTempRef > Td – Tm
Td – temperature value measured near desertificator (T3 sensor).
Tm – temperature value measured in the room (TLeadVal or T4 - depends on the TleadSensorSelect register value).</td></tr>
</table>

<table>
<tr><td>0x08</td><td>DestStratTimeDelay</td><td>Maximal start time delay of a heater after desertification condition is met.

Not used.</td></tr>
<tr><td>0x09</td><td>ModeAuto_FanEffRefMin</td><td>Minimal fan efficiency and fan efficiency after attaining target temperature in AUTO mode.

EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0A</td><td>ModeAuto_FanEffRefMax</td><td>Maximal fan efficiency in AUTO mode.

EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0B</td><td>ModeManual_FanEffRef</td><td>Fan efficiency after attaining target temperature in MANUAL mode.

EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table></td></tr>
</table>

Group DRV-V

Modbus Holding Registers

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.<table>
<tr><th>Value</th><th>Work state</th><th>Description</th></tr>
<tr><td>0</td><td>WM_DEF</td><td>Default value after power reset</td></tr>
<tr><td>1</td><td>WM_OFF</td><td>Device off</td></tr>
<tr><td>2</td><td>WM_HT_AUTO</td><td>Automatic heating</td></tr>
<tr><td>3</td><td>WM_HT_MANUAL</td><td>Manual heating</td></tr>
<tr><td>4</td><td>WM_COOL_AUTO</td><td>Automatic cooling</td></tr>
<tr><td>5</td><td>WM_COOL_MANUAL</td><td>Manual cooling</td></tr>
<tr><td>6</td><td>WM_VENT</td><td>Ventilation</td></tr>
</table></td></tr>
<tr><td>0x05</td><td>FanEffRef</td><td>Fan efficiency setting.
AC Fan - 3 steps.<table>
<tr><th>Value</th><th>Gear</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>0x06</td><td>DestModeForce</td><td>Destratification work mode.<table>
<tr><th>Value</th><th>Destratification work mode</th><th>Description</th></tr>
<tr><td>1</td><td>DEST_MD_OFF</td><td>Off</td></tr>
<tr><td>2</td><td>DEST_MD_AUTO_DEPEND</td><td>Work mode AUTO</td></tr>
<tr><td>3</td><td>DEST_MD_AUTO_INDEPEND</td><td>Work mode AUTO</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>0x07</td><td>DestTempRef</td><td>Target value for lunching desertification mode.
<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>0</td><td>0,0</td><td>Minimal value</td></tr><tr><td>50</td><td>5,0</td><td>Default value</td></tr><tr><td>100</td><td>10,0</td><td>Maximal value</td></tr></table>
Condition:
DestTempRef > Td – Tm
Td – temperature value measured near desertificator (T3 sensor).
Tm – temperature value measured in the room (TLeadVal or T4 - depends on the TleadSensorSelect register value).</td></tr>
<tr><td>0x08</td><td>DestStratTimeDelay</td><td>Maximal start time delay of a heater after desertification condition is met.
Not used.</td></tr>
<tr><td>0x09</td><td>ModeAuto_FanEffRefMin</td><td>Minimal fan efficiency and fan efficiency after attaining target temperature in AUTO mode.
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0A</td><td>ModeManual_FanEffRef</td><td>Fan efficiency after attaining target temperature in MANUAL mode.
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
</table>

Group DRV-OXEN

Modbus Holding Registers

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>FansEffRef_1</td><td>Fan efficiency setting in group I.
EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table>Note: FansEffRef_1 = FansEffRef_2</td></tr>
<tr><td>0x05</td><td>FansEffRef_2</td><td>Fan efficiency setting in group II.
EC Fan - speed variable in range 0 - 100%
<table><tr><th>Value</th><th>Fan speed</th><th>Description</th></tr><tr><td>0</td><td>0%</td><td>Minimal value</td></tr><tr><td>100</td><td>100%</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x06</td><td>OxenState</td><td>Work status.
<table><tr><th>Value</th><th>Work status</th><th>Description</th></tr><tr><td>0</td><td>OXEN_ST_OFF</td><td>Device off</td></tr><tr><td>1</td><td>OXEN_ST_ECO</td><td>Device on</td></tr><tr><td>2</td><td>OXEN_ST_CALENDAR</td><td>Device on</td></tr><tr><td>3</td><td>OXEN_ST_COMFORT</td><td>Device on</td></tr></table></td></tr>
<tr><td>0x07</td><td>OxenMode</td><td>Work mode (bypass) .
<table><tr><th>Value</th><th>Work status</th><th>Description</th></tr><tr><td>0</td><td>OXEN_MD_AUTO</td><td>Automatic adjustment (automatic adjustment)</td></tr><tr><td>1</td><td>OXEN_MD_WINTER</td><td>Winter adjustment (bypass off)</td></tr><tr><td>2</td><td>OXEN_MD_SUMMER</td><td>Summer adjustment (bypass on)</td></tr></table></td></tr>
<tr><td>0x08</td><td>RegParam_K</td><td>Adjustment (regulator) gain (OXEN HOT).
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>1000</td><td>Maximal value</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x09</td>
<td>RegParam_T</td>
<td>Doubling time for adjustment (regulator) (OXEN HOT).
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Minimal value</td></tr>
<tr><td>1000</td><td>Maximal value</td></tr>
</table>
</td>
</tr>
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Group DRV-EL

Modbus Holding Registers

Data:

<table>
<tr><th>Address</th><th>Name</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th>Value</th><th>Work status</th><th>Description</th></tr><tr><td>0x00</td><td>WM_TS</td><td>TS</td></tr><tr><td>0x01</td><td>WM_OFF</td><td>Device off</td></tr><tr><td>0x02</td><td>WM_AUTO</td><td>Automatic mode</td></tr><tr><td>0x03</td><td>WM_HEAT</td><td>Manual heating</td></tr><tr><td>0x04</td><td>WM_VENT</td><td>Ventilation</td></tr><tr><td>0x05</td><td>WM_RAW</td><td>Raw.
Not used.</td></tr></table></td></tr>
<tr><td>0x05</td><td>FanSpeedRef</td><td>Fan efficiency setting.
AC Fan - 3 steps.
<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x06</td><td>DestModeForce</td><td>Destratification work mode.
<table><tr><th>Value</th><th>Destratification work mode</th><th>Description</th></tr><tr><td>1</td><td>DEST_MD_OFF</td><td>Off</td></tr><tr><td>2</td><td>DEST_MD_AUTO_DEPEND</td><td>Work mode AUTO</td></tr><tr><td>3</td><td>DEST_MD_AUTO_INDEPEND</td><td>Work mode AUTO</td></tr></table></td></tr>
<tr><td>0x07</td><td>DestTempRef</td><td>Target value for lunching desertification mode.
<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>0</td><td>0,0</td><td>Minimal value</td></tr><tr><td>50</td><td>5,0</td><td>Default value</td></tr><tr><td>100</td><td>10,0</td><td>Maximal value</td></tr></table>
Condition:
DestTempRef > Td – Tm
Td – temperature value measured near desertificator (T3 sensor).
Tm – temperature value measured in the room (TLeadVal or T4 - depends on the TleadSensorSelect register value).</td></tr>
</table>

<table>
<tr><td>0x08</td><td>DestStratTimeDelay</td><td>Maximal start time delay of a heater after desertification condition is met.

Not used.</td></tr>
<tr><td>0x09</td><td>Electric heater PTC power EL L</td><td>Electric heater power for LEO EL L in manual heating work mode.

(SW3.5 = K1)

<table><tr><th>Value</th><th>L2 State</th><th>L1 State</th><th>Description</th></tr><tr><td>0x01</td><td>OFF</td><td>OFF</td><td>Off</td></tr><tr><td>0x02</td><td>OFF</td><td>ON</td><td>1 heat setting</td></tr><tr><td>0x03</td><td>ON</td><td>OFF</td><td>2 heat setting</td></tr><tr><td>0x04</td><td>ON</td><td>ON</td><td>3 heat setting</td></tr></table></td></tr>
<tr><td>0x0A</td><td>Electric heater PTC power EL S</td><td>Electric heater power for LEO EL S in manual heating work mode.

(SW3.5 = K2)

<table><tr><th>Value</th><th>L2 State</th><th>L1 State</th><th>Description</th></tr><tr><td>0x01</td><td>OFF</td><td>OFF</td><td>Off</td></tr><tr><td>0x02</td><td>OFF</td><td>ON</td><td>1 heat setting</td></tr><tr><td>0x03</td><td>ON</td><td>ON</td><td>2 heat setting</td></tr><tr><td>0x04</td><td>ON</td><td>ON</td><td>2 heat setting</td></tr></table></td></tr>
<tr><td>0x0B</td><td>ModeAuto_FanEffRefMin</td><td>Minimal fan efficiency and fan efficiency after attaining target temperature in AUTO mode.

AC Fan - 3 steps.

<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
<tr><td>0x0C</td><td>ModeManual_FanEffRef</td><td>Fan efficiency after attaining target temperature in MANUAL mode.

AC Fan - 3 steps.

<table><tr><th>Value</th><th>Gear</th><th>Description</th></tr><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></table></td></tr>
</table>

Group DRV-R

Holding Registers

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.<table>
<tr><th>Value</th><th>Work state</th><th>Description</th></tr>
<tr><td>0x00</td><td>WM_NS</td><td>Read only</td></tr>
<tr><td>0x01</td><td>WM_OFF</td><td>Device off</td></tr>
<tr><td>0x02</td><td>WM_SUMMER</td><td>Summer mode (ventilation)</td></tr>
<tr><td>0x03</td><td>WM_WINTER_THERMO</td><td>Winter mode (heating), thermostatic mode</td></tr>
<tr><td>0x04</td><td>WM_WINTER_CONT</td><td>Winter mode (heating), continuous mode</td></tr>
</table></td></tr>
<tr><td>0x0C</td><td>STBTemperatureAlarmOn</td><td>Target temperature to invoke STB alarm state (Inpur Register 0x12). If > T3 alarm occurs.

Default value ensures error occurrence before real STB Robur alarm (which needs manual reset from heater control box).<table>
<tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr>
<tr><td>810</td><td>81,0</td><td>Minimal value</td></tr>
<tr><td>900</td><td>90,0</td><td>Default value</td></tr>
<tr><td>1200</td><td>120,0</td><td>Maximal value</td></tr>
</table></td></tr>
<tr><td>0x0D</td><td>STBTemperatureAlarmOff</td><td>Target temperature to reset STB alarm state (Inpur Register 0x12). If > T3 alarm occurs.<table>
<tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr>
<tr><td>610</td><td>61,0</td><td>Minimal value</td></tr>
<tr><td>800</td><td>80,0</td><td>Maximal value</td></tr>
</table>Additional condition:

STB_T_OFF < STB_T_REF</td></tr>
</table>

Group DRV R KM

Holding Registers

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th>Value</th><th>Work state</th><th>Description</th></tr><tr><td>0x00</td><td>WM_NS</td><td>Read only</td></tr><tr><td>0x01</td><td>WM_OFF</td><td>Device off</td></tr><tr><td>0x02</td><td>WM_SUMMER</td><td>Summer mode (ventilation)</td></tr><tr><td>0x03</td><td>WM_WINTER_THERMO</td><td>Winter mode (heating), thermostatic mode</td></tr><tr><td>0x04</td><td>WM_WINTER_CONT</td><td>Winter mode (heating), continuous mode</td></tr></table></td></tr>
<tr><td>0x05</td><td>DamperForceMode</td><td>Damper forcing mode.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>DAMPER_FMD_NS</td><td>Read only</td></tr><tr><td>0x01</td><td>DAMPER_FMD_OFF</td><td>Forcing mode off</td></tr><tr><td>0x02</td><td>DAMPER_FMD_ ON</td><td>Depends on air draw temperature:
if (T1 < DamperForceTempRef)
{
DamperLevelRef = DamperForceRef;
}</td></tr></table></td></tr>
<tr><td>0x06</td><td>DamperForceTempRef
Data type:
Signed Int16</td><td>Target temperature to force damper (work mode DamperForceMode == DAMPER_FMD_ON).
Combined with T1 (fresh air temperature - Input Register 0x04).
<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>-100</td><td>-10,0</td><td>Minimal value</td></tr><tr><td>0</td><td>0</td><td>Default value</td></tr><tr><td>150</td><td>15,0</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x07</td><td>DamperForceLevelRef</td><td>Target temperature value to open damper. (work mode DamperMode == DAMPER_FMD_ ON) condition: Temp < DamperForceTempRef
<table><tr><th>Value [%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x08</td><td>DamperLevelRef</td><td>Damper position.<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x09</td><td>DamperContLevelRef</td><td>Damper position when:
WorkMode == WM_WINTER_CONT.<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>30</td><td>Default value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0A</td><td>FanRoofForceEffRef</td><td>Forcing fan roof ventilator speed (efficiency will be increased by FanRoofForceEffRef).<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>-100</td><td>Minimal value</td></tr><tr><td>0</td><td>Default value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0B</td><td>FanRoofMode</td><td>Fan roof work mode.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>FR_MD_NS</td><td>Ready only</td></tr><tr><td>0x01</td><td>FR_MD_01</td><td>Depends on damper position (DamperLevelRef) and fan efficiency settings (FanEffRef)</td></tr><tr><td>0x02</td><td>FR_MD_02</td><td>Depends on damper position (DamperLevelRef)</td></tr></table></td></tr>
<tr><td>0x0C</td><td>STBTemperatureAlarmOn</td><td>Target temperature to invoke STB alarm state (Inpur Register 0x12). If > T3 alarm occurs.
Default value ensures error occurrence before real STB Robur alarm (which needs manual reset from heater control box).<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>810</td><td>81,0</td><td>Minimal value</td></tr><tr><td>900</td><td>90,0</td><td>Default value</td></tr><tr><td>1200</td><td>120,0</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0D</td><td>STBTemperatureAlarmOff</td><td>Target temperature to reset STB alarm state (Inpur Register 0x12). If > T3 alarm occurs.<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>610</td><td>61,0</td><td>Minimal value</td></tr><tr><td>800</td><td>80,0</td><td>Maximal value</td></tr></table>Additional condition:
STB_T_OFF < STB_T_REF</td></tr>
</table>

Group DRV-R NEXT

Holding Registers

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th>Value</th><th>Work state</th><th>Description</th></tr><tr><td>0x00</td><td>NS</td><td>Read only</td></tr><tr><td>0x01</td><td>OFF</td><td>Device off</td></tr><tr><td>0x02</td><td>HEAT_AUTO</td><td>Automatic mode</td></tr><tr><td>0x03</td><td>HEAT_MANUAL</td><td>Manual heating</td></tr><tr><td>0x04</td><td>VENT</td><td>Ventilation mode</td></tr></table></td></tr>
<tr><td>0x0C</td><td>STB Temperature Alarm On</td><td>Target temperature to invoke STB alarm state (Inpur Register 0x12). If > T3 alarm occurs.
Default value ensures error occurrence before real STB Robur alarm (which needs manual reset from heater control box).
<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>810</td><td>81,0</td><td>Minimal value</td></tr><tr><td>900</td><td>90,0</td><td>Default value</td></tr><tr><td>1200</td><td>120,0</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0D</td><td>STB Temperature Alarm Off</td><td>Target temperature to reset STB alarm state (Inpur Register 0x12). If > T3 alarm occurs.
<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>610</td><td>61,0</td><td>Minimal value</td></tr><tr><td>800</td><td>80,0</td><td>Maximal value</td></tr></table>Additional condition:
STB_T_OFF < STB_T_REF</td></tr>
<tr><td>0x0E</td><td>Continuos Mode Fan Speed Ref</td><td>Fan speed after attaining target temperature
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Read only</td></tr><tr><td>0x01</td><td>Fan on</td></tr><tr><td>0x02</td><td>Fan off</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x0F</td>
<td>Gas Burner Level Ref</td>
<td>Gas heater power in manual heating work mode.

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0x00</td><td>Read only</td></tr>
<tr><td>0x01</td><td>Gas burner first step</td></tr>
<tr><td>0x02</td><td>Gas burner second step</td></tr>
</table>
</td>
</tr>
</table>

Group DRV R KM NEXT

Holding Registers

<table>
<tr><th>Address</th><th>Parameter</th><th>Description</th></tr>
<tr><td>0x04</td><td>WorkMode</td><td>Work mode.
<table><tr><th>Value</th><th>Work state</th><th>Description</th></tr><tr><td>0x00</td><td>NS</td><td>Read only</td></tr><tr><td>0x01</td><td>OFF</td><td>Device off</td></tr><tr><td>0x02</td><td>HEAT_AUTO</td><td>Automatic heating mode</td></tr><tr><td>0x03</td><td>HEAT_MANUAL</td><td>Manual heating mode</td></tr><tr><td>0x04</td><td>VENT</td><td>Ventilation mode</td></tr></table></td></tr>
<tr><td>0x05</td><td>DamperForceMode</td><td>Damper forcing mode.
<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>DAMPER_FMD_NS</td><td>Read only</td></tr><tr><td>0x01</td><td>DAMPER_FMD_OFF</td><td>Forcing mode off</td></tr><tr><td>0x02</td><td>DAMPER_FMD_ ON</td><td>Depends on air draw temperature:
if (T1 < DamperForceTempRef)
{
DamperLevelRef = DamperForceRef;
}</td></tr></table></td></tr>
<tr><td>0x06</td><td>DamperForceTempRef
Data type:
Signed Int16</td><td>Target temperature to force damper (work mode DamperForceMode == DAMPER_FMD_ON).
Combined with T1 (fresh air temperature - Input Register 0x04).
<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>-100</td><td>-10,0</td><td>Minimal value</td></tr><tr><td>0</td><td>0</td><td>Default value</td></tr><tr><td>150</td><td>15,0</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x07</td><td>DamperForceLevelRef</td><td>Target temperature value to open damper. (work mode DamperMode == DAMPER_FMD_ ON) condition: Temp < DamperForceTempRef
<table><tr><th>Value [%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
</table>

<table>
<tr><td>0x08</td><td>DamperLevelRef</td><td>Damper position.<table><tr><th>Value[%]</th><th>Description</th></tr><tr><td>0</td><td>Minimal value</td></tr><tr><td>100</td><td>Maximal value</td></tr></table></td></tr>
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<tr><td>0x0B</td><td>FanRoofMode</td><td>Fan roof work mode.<table><tr><th>Value</th><th>Name</th><th>Description</th></tr><tr><td>0x00</td><td>FR_MD_NS</td><td>Ready only</td></tr><tr><td>0x01</td><td>FR_MD_01</td><td>Depends on damper position (DamperLevelRef) and fan efficiency settings (FanEffRef)</td></tr><tr><td>0x02</td><td>FR_MD_02</td><td>Depends on damper position (DamperLevelRef)</td></tr></table></td></tr>
<tr><td>0x0C</td><td>STBTemperatureAlarmOn</td><td>Target temperature to invoke STB alarm state (Inpur Register 0x12). If > T3 alarm occurs.
Default value ensures error occurrence before real STB Robur alarm (which needs manual reset from heater control box).<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>810</td><td>81,0</td><td>Minimal value</td></tr><tr><td>900</td><td>90,0</td><td>Default value</td></tr><tr><td>1200</td><td>120,0</td><td>Maximal value</td></tr></table></td></tr>
<tr><td>0x0D</td><td>STBTemperatureAlarmOff</td><td>Target temperature to reset STB alarm state (Inpur Register 0x12). If > T3 alarm occurs.<table><tr><th>Value</th><th>Temperature [K]</th><th>Description</th></tr><tr><td>610</td><td>61,0</td><td>Minimal value</td></tr><tr><td>800</td><td>80,0</td><td>Maximal value</td></tr></table>Additional condition:
STB_T_OFF < STB_T_REF</td></tr>
</table>

<table>
<tr>
<td>0x0E</td>
<td>Continuos Mode Fan Speed Ref</td>
<td>Fan speed after attaining target temperature.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Read only</td></tr><tr><td>0x01</td><td>Fan on</td></tr><tr><td>0x02</td><td>Fan off</td></tr></table></td>
</tr>
<tr>
<td>0x0F</td>
<td>Gas Burner Level Ref</td>
<td>Gas heater power in manual heating work mode.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>Read only</td></tr><tr><td>0x01</td><td>Gas burner first step</td></tr><tr><td>0x02</td><td>Gas burner second step</td></tr></table></td>
</tr>
</table>