Application

The 540CMD01 is a module of the RTU540 product line consisting of a communication unit (CMU) and a galvanic isolated wide range power supply (PSM) in a metal DIN rail housing.

The essential tasks are:
- Managing and controlling of the RTU520 I/O modules via the serial I/O bus
- Reading Process events from the input modules.
- Send commands to the output modules.
- Communicating with control systems and local HMI systems via the serial interfaces (RS232) and the Ethernet 10/100BaseT interfaces.
- Communication with Sub-RTU’s, IED’s or multimeter devices via the interfaces (RS485) and the Ethernet interfaces.
- Managing the time base for the RTU540 product line station and synchronizing the I/O modules.
- Handling the dialog between RTU540 product line and Web-Browser via the LAN interfaces.

The unit has a battery buffered real time clock (RTC).

Characteristics

On the applied ARM cortex A8 controller AM3352 a real-time operating system is implemented. The 540CMD01 is responsible for the interface management, the event handling, the time base and the internal data base. The controller acts as master for the serial I/O bus (WRB).

System relevant configuration files are stored in the non-volatile flash memory card (removable SD-card™) in order to guarantee a valid system configuration after Power on Reset (PoR).

A battery buffered RTC is used to keep an exact time during power off state.
The communication unit provides the following interfaces:
- Communication Port 1 ... 4 (CP1 ... CP4): serial interfaces according RS232C or RS485 with RJ45 connectors.
- Ethernet interface 1 and 2 (E1 & E2): 10/100BaseT with RJ45 connector.
- USB 2.0 device interface for diagnosis and maintenance purposes.
- USB 2.0 host interface for future extensions.
- WRB I/O bus interface for local communication with the I/O-modules.

Figure 2: Top side of 540CMD01 housing

Figure 3: Front side of 540CMD01 housing

Figure 4: Bottom side of 540CMD01 housing
In addition to the RTU500 series general technical data, the following applies:

**Main Processing Unit MPU**
- **CPU**: ARM cortex A8, AM3352 @ 800 MHz
- **RAM**: 256 MByte
- **Boot Flash**: 8 MByte

**SD card**
- **Connector**: SD card slot (push push)
- **Type**: SD 2.0, class 2
- **Capacity**: 4 GByte

**Real time clock RTC (Backup)**
- **Battery**: Lithium 3 V DC, CR2032
- **Time resolution**: 1 sec, 1ms with timesync
- **Battery lifetime**: > 10 years
- **Free running**: ± 50 ppm

**Serial interfaces 1, 2, 3, 4**
- **Connector**: RJ45
- **Type**: RS232C or RS485
  - **RS232C**:
    - **Bit rate**: 200 bit/s - 38.4 kbit/s
    - **Signal lines**: GND, GND, TxD, D1/103, RxD, D2/104, RTS, S2/105, CTS, M2/106, DTR, S1.2/108, DCD, M5/109
    - **Level**: typical: ± 6V
  - **RS485**:
    - **Bit rate**: 200 bit/s - 38.4 kbit/s
    - **Level**: typical: ± 6V

**Ethernet interface E1 and E2**
- **Connector**: RJ45
- **Type**: IEEE 802.3, 10/100BaseT

**USB interface 1**
- **Connector**: USB Type A (for future extensions)
- **Type**: USB 2.0 host, low and full speed (max. 12 MBit/s)

**USB interface 2**
- **Connector**: USB Type B (configuration interface)
- **Type**: USB 2.0 device, low and full speed (max. 12 MBit/s)

**Signaling by LEDs**
- **ERR (red)**: ON: RTU in error state
  - Flashing: RTU in warning state
  - For more details see RTU500 series
- **RUN (green)**: Communication module in operation
- **PF (red)**: Failure of one of the internal voltages (24 V DC not included)
- **I/O bus (green)**: Transmission on to the I/O bus
- **T**: Transmit data on serial communication ports CP
- **R**: Receive data on serial communication ports CP
- **S**: Ethernet communication speed:
  - ON: 100 Mbit/s
  - OFF: 10 Mbit/s
- **L**: Link up on Ethernet interface E

**Power supply input**
- **Input voltage**: 24 ... 125 V DC
- **Input tolerance range**: -20%... +20%
- **Max. input current**: 2 A
- **Efficiency**: 88% @ 24 V DC
- **Power consumption**: 5.4 Watt (0.0 A @ 24 V out)
- **External circuit-breaker**: The plus lead needs a be protected by a circuit-breaker upstream with 10 A trip current.
- **Reverse voltage protection**: yes
- **Potential isolation between input and outputs**: yes

**Power supply output**
- **Total output power**: 30 W

**24 V DC power supply output**
- **Voltage**: 24 V DC (galvanic isolated)
- **Tolerance**: ±20 %
- **Max. current**: 500 mA
- **Residual ripple**: ≤ 200 mVpp

**Current supply for power supplied via WRB bus**
- **5 V DC (±5 %)**: 1.8 A
## Current supply for power supplied via WRB bus

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>±15 V DC (±10%)</td>
<td>200 mA</td>
</tr>
<tr>
<td>18 V DC (±20%)</td>
<td>50 mA</td>
</tr>
</tbody>
</table>

## Mechanical layout

<table>
<thead>
<tr>
<th>Dimension</th>
<th>204 mm x 105 mm x 70 mm (Width x Height x Depth)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Housing type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting</td>
<td></td>
</tr>
</tbody>
</table>

| Weight                     | ca. 940 g                                         |

## Immunity test

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Specification</th>
<th>Performance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic discharge</td>
<td>IEC 61000-4-2</td>
<td>8 kV air / 6 kV contact (level 3)</td>
</tr>
<tr>
<td>Radiated Radio-Frequency Electromagnetic Field</td>
<td>IEC 61000-4-3</td>
<td>10 V/m (level 3)</td>
</tr>
<tr>
<td>Electrical Fast Transient / Burst</td>
<td>IEC 61000-4-4</td>
<td>4 kV (level X)</td>
</tr>
<tr>
<td>Surge</td>
<td>IEC 61000-4-5</td>
<td>4 kV (level 4)</td>
</tr>
<tr>
<td>Conducted Disturbances, induced by Radio-Frequency Fields</td>
<td>IEC 61000-4-6</td>
<td>10 V (level 3)</td>
</tr>
<tr>
<td>Damped oscillatory wave</td>
<td>IEC 61000-4-18</td>
<td>2.5 kV / 1 kV (level 3)</td>
</tr>
</tbody>
</table>

## Environmental conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Specification</th>
<th>Performance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal operating temperature range</td>
<td>EN 60068-2-1, -2-2, -2-14</td>
<td>-25°C... 70°C</td>
</tr>
<tr>
<td>Start up</td>
<td>EN 60068-2-1, -2-2, -2-14</td>
<td>-40 °C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>EN 60068-2-30</td>
<td>5... 95 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(non condensing)</td>
</tr>
</tbody>
</table>

## Ordering information

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>540CMD01</td>
<td>R0001</td>
</tr>
<tr>
<td>1KGT037400R0001</td>
<td>1KGT037400R0001</td>
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