Application, characteristics and technical data have to be taken from the hardware data sheet:

560CID11 Data sheet 1KGT 150 804

Operation

The 560CID11 is a DIN rail RTU500 series consisting of a communication unit (CMU), a multi-I/O module (MIO) and a power supply (PSU) in a metal DIN rail housing.

The essential tasks of the 560CID11 are:
- Capturing of 8 analog input signals (mA or V signals)
- Capturing of 16 digital input signals
- Output of 8 binary commands (by relay)
- (1 out of n) check
- Managing and controlling of the RTU211 I/O modules via the 10 pole Wired-OR-Bus (WRB).
- Reading Process events from the input boards.
- Writing commands to the output boards.
- Communicating with control systems and local MMI systems via the 4 integrated serial line interfaces and the 2 Ethernet 10/100 BaseT LAN interfaces.
- Managing the time base for the RTU560 station and synchronizing the I/O modules.
- Handling the dialogue between RTU560 and Web-Browser via the Ethernet interface.

To force the IP-Address to a default value at start-up, the “Def. IP-Addr” switch on the front side has to be switched “ON”. The 560CID11 starts with the factory settings for the Ethernet Interface which are 192.168.0.1 for the IP-address with the network setting 255.255.255.0 for the subnet mask and 192.168.0.20 for the gateway.

Serial Interfaces

The serial interfaces (CP1, CP2, CPA and CPB) are available on the RJ45 connector on the front plate. It can interface RS485 or RS232C signals.

The interfaces are available on the RJ45 connectors and designed for RS485. The bus is terminated by a 1 kΩ resistor for the interfaces.

The signals are used according to:

### Serial interface RS485

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Input/Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>Not used</td>
</tr>
<tr>
<td>2</td>
<td>TA</td>
<td>Data -</td>
</tr>
<tr>
<td>3</td>
<td>TB</td>
<td>Data +</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>Not used</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Signal Ground</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>Not used</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>Not used</td>
</tr>
<tr>
<td>8</td>
<td>Shield</td>
<td>Connected with housing</td>
</tr>
</tbody>
</table>

The RS485 cable length should be less than 150 m.

In RS232C mode the signals are used according to:

### Serial interface RS232C

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Input/Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DCD</td>
<td>Input</td>
</tr>
<tr>
<td>2</td>
<td>RxD</td>
<td>Input</td>
</tr>
<tr>
<td>3</td>
<td>TxD</td>
<td>Output</td>
</tr>
<tr>
<td>4</td>
<td>DTR</td>
<td>Output</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>DSR</td>
<td>Input</td>
</tr>
<tr>
<td>7</td>
<td>RTS</td>
<td>Output</td>
</tr>
<tr>
<td>8</td>
<td>CTS</td>
<td>Input</td>
</tr>
</tbody>
</table>

The RS232C standard defines a maximum cable length of 15 m.

**Advice**

In case of longer cable length adequate provisions for potential equalization must be ensured to prevent damage on the modules and installations.
CP1 and CP2 Interface

At the CP1 and CP2 interfaces connected to an USART (universal synchronous/asynchronous receiver/transmitter) different UART based protocol types can be used.

CPA and CPB Interface

The settings have to be done by the RTUtil500 configuration tool.

At the CPA and CPB interfaces different UART character based protocol types can be used.

Ethernet interfaces E1 and E2

The Ethernet interfaces E1 and E2 on the front plate supports different functions:
- Webserver-diagnostic with download of configuration files and firmware
- Protocol IEC 60870-5-104, DNP3, ...
- Integrated HMI

The signals are used according to:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Input/Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TD +</td>
<td>Output</td>
</tr>
<tr>
<td>2</td>
<td>TD -</td>
<td>Output</td>
</tr>
<tr>
<td>3</td>
<td>RD +</td>
<td>Input</td>
</tr>
<tr>
<td>4</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RD -</td>
<td>Input</td>
</tr>
<tr>
<td>7</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Shield</td>
<td>Connected with housing</td>
</tr>
</tbody>
</table>

Each network segment can have a maximum cabling distance of 100 metres with Cat-5-cable.

ADVICE

In case of longer cable length adequate provisions for potential equalization must be ensured to prevent damage on the modules and installations.

IO-Bus

The connection to the local I/O boards is done by a 20 pole female connector. The connection to the serial peripheral bus (Wired OR-Bus) is done by a 20 pole male connector. The package of the 23AD62 or 211ADD52 module includes one ribbon cable. The ribbon cable should not exceed a length of 50cm (20inch).

Main Power Supply (MPS)

The supply voltage for the 560CID11 is 24VDC. The connector X4 consists of a 3 pole pluggable screw-terminal 5.08mm. The maximum input power is 67 Watt.

3 Pole Power Connector

Main Power Supply

<table>
<thead>
<tr>
<th>Pin</th>
<th>DC-IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vin (+)</td>
</tr>
<tr>
<td>2</td>
<td>Vin (-)</td>
</tr>
<tr>
<td>3</td>
<td>Earth</td>
</tr>
</tbody>
</table>

560CID11 Earthing

On the strength of safety and EMC protection it is important to make a connection as short as possible to a system earth (may be DIN-rail or mounting plate). An ordinary 1.5mm² multi-core wire (green/yellow) can be used and should not exceed a length of 100 cm (39 inch). Pin X4-3 of the 3 pole DC-In connector is the earth-pin. The protection earth must be connected there.

The power supply terminal X4-2 (Vin -) is internal connected with the housing potential by jumper X9.

Signalling

The LED’s of the 560CID11 are controlled by the RTU560 firmware (except Tx and Rx). For the definition and operation of the LED “ERR” please refer to the release specific function description. The connector embedded LEDs “Tx” and “Rx” are directly connected to the receiver/transmitter of the communication line. The LEDs “Act” and “Lnk” are directly connected to the Ethernet-controller.

The table below describes the system LEDs of the 560CID11.

Meaning of LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Colour</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERR</td>
<td>(1x) red</td>
<td>Warning / Error</td>
</tr>
<tr>
<td>Tx</td>
<td>(4x) green</td>
<td>Transmit data (CP1, 2, A, B)</td>
</tr>
</tbody>
</table>
### Input / Output

The multi-I/O-part of the 560CID11 board scans analog and digital signals and prepares them for the RTU560 on the basis of predefined parameters.

The board is available in two versions:
- R0001: 24 … 60 V DC process voltage
- R0002: 110 / 125 V DC process voltage

In general the 560CID11 board can process the following signals:
- Max. 8 analog inputs
- Max. 16 binary inputs
- Max. 8 binary outputs

In addition the 560CID11 is equipped with an (1 out of n) check circuit for command output.

### Processing functions

#### Analog Input

Each analog input can process the following functions:
- Zero point monitoring
- Switching recognition
- Smoothing
- Threshold value monitoring of absolute value or with accumulation and periodic background transmission
- Limit value supervision of 4 limits

Input signal conversion

The 560CID11 board transmits the measured value with 12-bit plus sign. The scaling for the telecontrol transmission protocol presentation is done by the CMU.

#### Binary Input

The 16 binary inputs of the 560CID11 are grouped into two groups of 8 inputs each. Each group has its own common return.

The 560CID11 board scans all 16 binary inputs every millisecond and prepares them for the RTU560 on the basis of predefined parameters.

The board 560CID11 supports:
- 16 single indications with time stamp
- 8 double indications with time stamp
- 2 digital measured values with 8-bit
- 1 digital measured value with 16-bit
- 16 pulse counters
  - channel 1 up to 16 kHz count events,
  - all others up to 120 Hz count events
  (on the lower eight input channels)

### Firmware Version

The current firmware version will be delivered on a CompactFlash™ memory card. A new firmware file can be loaded via the Web diagnostic tool into the removable CompactFlash™ memory card.

The 560CID11 will be delivered without a CompactFlash™ memory card.

For changing the CompactFlash™ memory card the right side of the housing has to be opened.

### ADVICE

For changing the CompactFlash™ card follow the instructions below:
1. Disconnect the power-supply of the 560CID11.
2. Take care of ESD protection before opening the 560CID11 housing.
3. Open the 4 screws on the right side of the housing.
4. Pull or plug only the CF-card. Don’t touch other components.
5. Close the housing before the power-supply is connected to the 560CID11.
Binary Output

The 560CID11 has 8 binary output channels equipped with relays. The outputs are isolated from the electronic part by means of optocoupler. Each output channel has its own return.

The 560CID11 can process the following commands:
- Commands with 1 or 2 pole connection without (1 out of n) check
- Commands with 1 or 2 pole connection with (1 out of n) check
- Regulation commands (1 and 2 pole)
- Setpoint commands (8 bit)
- Bit string output (1, 2 or 8 bit)

(1 out of n) check circuit

Two transistor outputs are available to connect two external relays X1-4 and X1-5 and for the integrated (1 out of n) check circuit of the 560CID11.

The check circuit can be used also for additional output boards.

The resistor measurement range for the integrated (1 out of n) check circuit can be configured between 100Ω and 10kΩ in steps of 10Ω by the RTUtil500 configuration tool.

Settings

Analog Input

Input Signal Range

The voltage/current measuring range can be independently configured for each of the channels by switches (DIP-Switches) S1 and S2.

![Analog Input 560CID11](image)

Figure 1: Analog Input 560CID11

The measuring range for the channels 1 to 5 (X3-1 to X3-10) can be configured with S1. The measuring range for the channels 6 to 8 (X7-7 to X7-2) can be configured with S2.

The configuration of the switches S1 and S2 have to be assumed into the RTUtil500 configuration tool.

The switch configuration for the different measuring ranges is shown in the table below.

<table>
<thead>
<tr>
<th>Analog Input Measurement Range Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>On</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>CH2</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>On</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>CH3</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>On</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>CH4</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>On</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>CH5</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>On</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>CH6</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>On</td>
</tr>
<tr>
<td>Off</td>
</tr>
<tr>
<td>CH7</td>
</tr>
<tr>
<td>Off</td>
</tr>
</tbody>
</table>

ADVICE

The default configuration of the Analog Inputs is set to measuring voltages.
Configuring the line frequency

The information about the line frequency is requested for the A/D conversion. The configured line frequency is valid for all 8 channels and will be configured by a parameter at the RTUtil500 configuration tool.

<table>
<thead>
<tr>
<th>Configuration of line frequency</th>
<th>Conversion time per input [ms]</th>
<th>Complete scan cycle [ms]</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Hz</td>
<td>50.0</td>
<td>400</td>
</tr>
<tr>
<td>50 Hz</td>
<td>60.0</td>
<td>480</td>
</tr>
<tr>
<td>16.6 Hz</td>
<td>180.0</td>
<td>1440</td>
</tr>
</tbody>
</table>

In addition max. two channels can operate at the fast-scan mode (the other channels will be deactivated at the fast-scan mode). For the fast-scan mode following values are valid:

<table>
<thead>
<tr>
<th>Configuration of line frequency at fast-scan mode</th>
<th>Conversion time per input [ms]</th>
<th>Complete scan cycle [ms]</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Hz</td>
<td>50.0</td>
<td>100</td>
</tr>
<tr>
<td>50 Hz</td>
<td>50.0</td>
<td>100</td>
</tr>
<tr>
<td>16.6 Hz</td>
<td>100.0</td>
<td>200</td>
</tr>
</tbody>
</table>

Factory calibration

Onsite calibration of the A/D converter is not necessary.

The 560CID11 is calibrated for all channels and measuring ranges at the factory. During the calibration the firmware calculates a rating value per measuring range and channel and stores this rating value in an EEPROM.

Binary Input

The 560CID11 has no switch or jumper for the binary input part.

Binary Output

The output solid state relay circuit (24V DC) is monitored during the output process.

Connections

Power Supply

The power supply for the 560CID11 R0001 and for the 560CID11 R0002 will be connected to screw terminal X4-1 (+) and X4-2 (-) and will be relayed internal to the power supply unit board.

The protection earth must be connected to screw terminal 4-3 for both 560CID11 revisions.

The power supply terminal X4-2 (-) is internal connected with the housing potential by jumper X9.

In rare cases (e.g. when grounding signal zero to Vin (+)) the jumper X9 has to be removed. Opening of the housing is done in the same way as for changing the CF card but the opposite side has to be open.

Analog Input

The process signals will be connected to screw terminal X3-1 to X3-10 (channel 1 to 5) and X7-7 to X7-2 (channel 6 to 8).

The analog inputs are designed for current range from 2mA, 5mA, 10mA, 20mA to 40mA (bipolar) and voltage range from 2V to 20V (bipolar).

Binary Input

The process signals will be connected to screw terminal X5-19 to X5-12 (channel 1 to 8) and X5-8 to X5-1 (channel 9 to 16).

The common return for the first eight channels is screw terminal X5-11, for the last eight channels X5-9.
Binary Output

The process signals will be connected to screw terminal X2 (channel 1 to 8).

Figure 10 shows the one pole connection.

For a 2 pole connection two internal relays of the 560CID11 are used (e.g. C1 and C3 for a double command output, and C2 and C4).

(1 out of n) check circuit

For the (1 out of n) check two external relays are used, which will be connected to X1-4 (GO relay R9, optional) and X1-5 (measurement relay R10). X1-6 (+) and X1-7 (-) is the input for the integrated check circuit.

ADVICE

The external relays are not scope of delivery! ABB recommend following relay: Finder, miniature-relay (55.32.9.024.0090, 24VDC, 2W, 10A)

The measuring relays are switched on and the configured delay time has to be expire before the actual measuring starts.

Process Voltage (UP)

The process voltage will be connected to screw terminal X1-3 (+) and X1-2 (-). The function earth can be connected to screw terminal X1-1(PE).

Main Supply Supervision (MSS)

By using an AC-power supply unit (e.g. 23VG23) with integrated battery load control a MSS is necessary. Therefore the 23AC62 unit is required. The MSS shows the status of the battery, cabling and fuse protection.

ALARM – Output (ALR)

If an error condition occurs in the RTU the ALR- output will be switched. RTU error conditions have to be taken from the function description of the RTU560 releases.

The alarm output is a normal close contact which will be opened if alarm status is off.

Signaling

Analog Input

The analog input part of the 560CID11 has no external signaling.

Binary Input

16 yellow LED’s are mounted on the front side of the 560CID11, showing the actual state of the binary inputs.

Binary Output

8 yellow LED’s are mounted on the front side of the 560CID11, showing the actual state of the binary output channels.
**Figure 5: Power Supply 560CID11 R0001**

**Figure 6: Power Supply 560CID11 R0002**
Figure 7: Binary Input 560CID11
Figure 8: Binary Input 560CID11, 1 pole connection

Figure 9: Binary Output, single command, 2 pole connection
Figure 10: Binary Output, double command, 2 pole connection

Figure 11: Binary Output, (1 out of n) check
Figure 12: Placement of the terminal screws and switches
Settings

Hardware settings and operation of the communication Interfaces of the 560CID11 and IO-settings are carried out with the RTUtil500 configuration tool. For the configuration procedure of the communication Interfaces and the IO-Bus, please refer to the RTUtil500 user guide.

The following parameters have to be defined for all protocols:
- Baudrate: 50 to 19 200 baud
- Direct link (TxD/RxD only)
- WT link full duplex (560FSM10/11 no handshake)
- WT link half duplex (560FSM10/11 with RTS / DCD)
- Dial up (external modem without handshake, without RTS / CTS)
- Loop switch unit (RP570/71 Host Interface only)
- Link with collision avoidance (TxD, RxD, DCD, without handshake (DNP 3.0 only)

The settings of the Ethernet Interfaces are:
- Node name
- IP address
- Subnet mask
- Default gateway
- Routing information
- Number of the host Interfaces.

![Figure 13: Top side of 560CID11 housing](image)

![Figure 14: Front and right side of 560CID11 housing](image)

![Figure 15: Bottom side of 560CID11 housing](image)
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