Introduction

HG RTU660 Remote Terminal Unit

As a part of substation automation product for transmission and sub-transmission, HG introduces RTU660 which represents different state of the art I/O modules, along with high end network interfacing - offering maximum flexibility with the highest number of supported protocols for sub and host communications. Designed to handle the highly complex systems in grid automation and control interfacing. RTU660 connects to all kinds of IEDs, parallel and serial I/Os, and communication via IEC 68150. All this real time data can then be transmitted to the central SCADA systems for critical actions -protecting your primary equipment from overloading of the grid.

In the current document, a brief introduction of the HG-RTU660 basic modules will be presented, as well as corresponding technical specifications.

- **Main Subrack – 660SFR02**

Description

660SFR02 is the mounting frame in form of 19” subrack, with flexible configuration for I/O, CPU and power supply modules. It can be installed in swing frame racks.

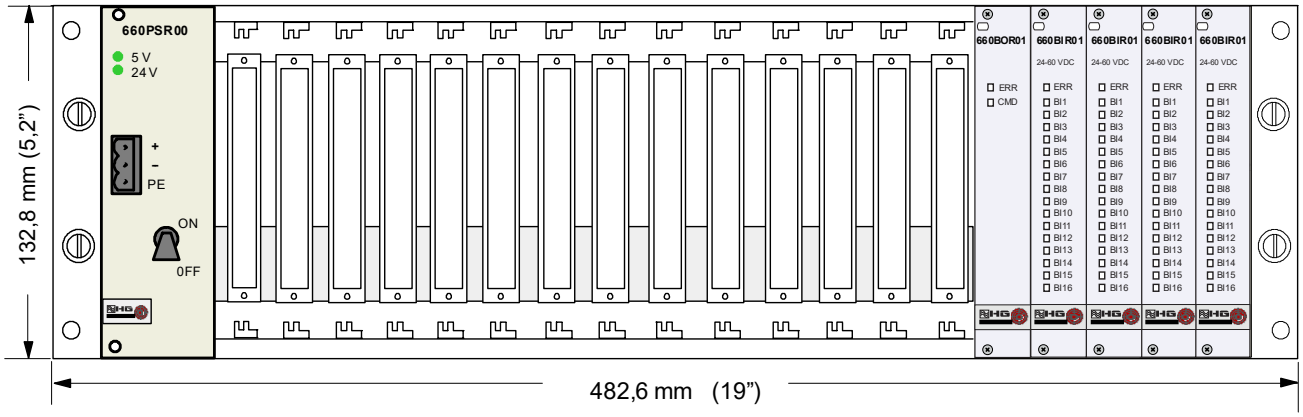

Figure 1. Front view of 660SFR02 subrack

Application

The 660SFR02 rack is designed to be used with or without redundant power supply. Therefore, it has 2 slots for redundant power supply units (PSU). Up to 18 slots can be used for I/O boards, communication units (CMU) or a mixture of both. It is interfaced to other racks via the RTU660 serial peripheral bus. Up to 7 of 660SFR02 racks can be connected to an I/O bus segment. By using the bus connection unit 660BCU05, the 660SFR02 becomes a rack with up to 8 communication units. Also for some functions the usage of 660BCU05 is required, even if only one CMU is inserted it is installed in a swing frame cabinet or in a frame.
Only in slot 19 the second PSU can be inserted and will be operated. It is not allowed to put in other modules. Slot 18 is available, when the option of the second PSU is not used.

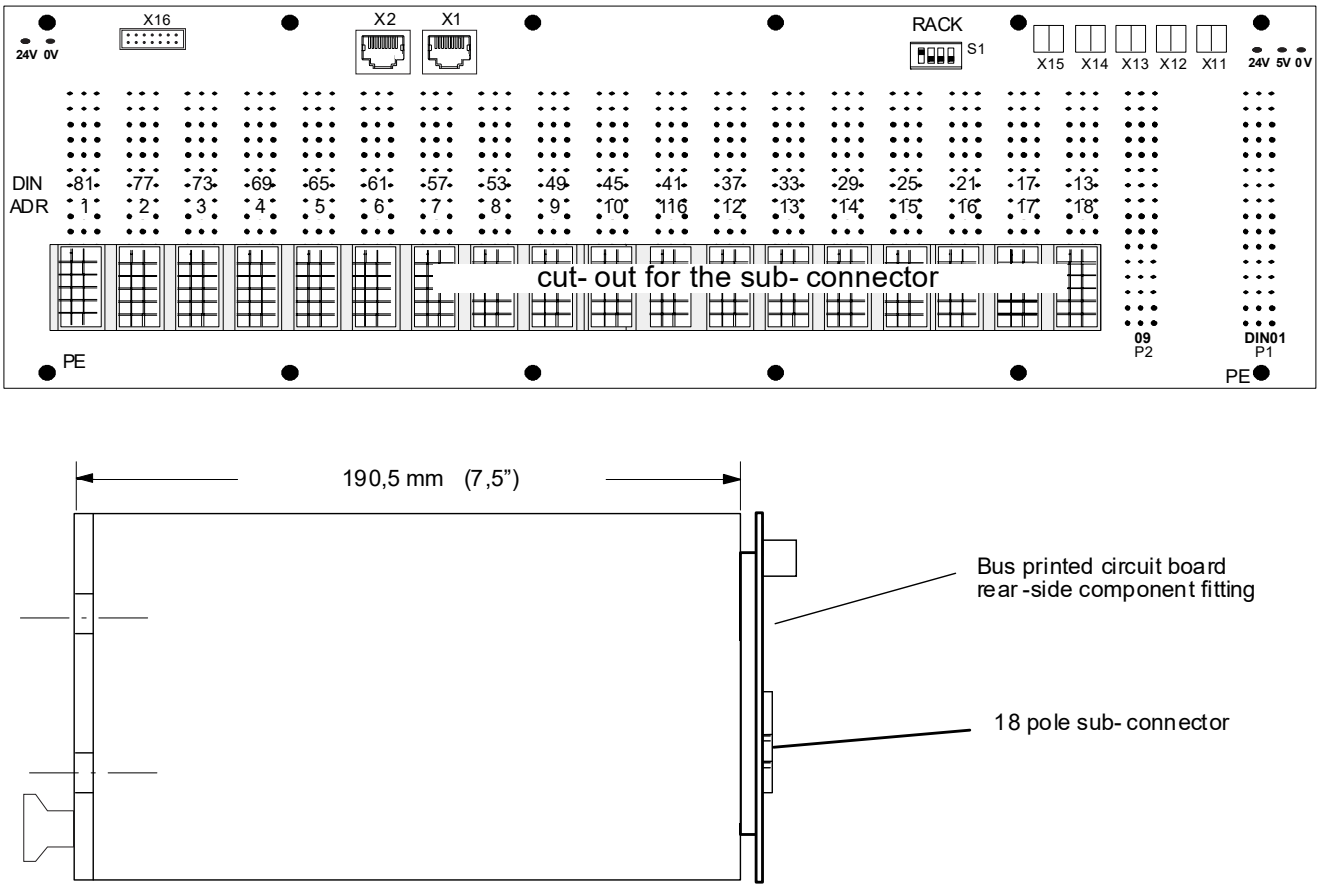

Figure 2. Rear and side views of 660SFR02 subrack

Technical Data

In addition to the RTU660 general data, the following applies:

Rack

	19“, 3 HE, 20 slots according DIN 41494 1 slot = 20.32 mm
Dimensions	132,8 x 482,6 x 210 mm (H x W x D)
With boards	232 mm (D)
With boards and connector	280 mm (D)
Weight	2.6 kg

Printed Circuit Board

Dimensions	433,7 x 132,8 mm (W x H)

Type of Connection

Peripheral boards	Indirect, 48 pole, Type F DIN 41612 with cut-out for sub-connector
Process signal connection	18 pole sub-connector with crimp clips

Monitoring Connections

Power Supply WARNING

X13, X14, X15	Plug-in terminal strip, 2-pole each
Relay contact	Normal closed contact 1 A / 60 V DC / 30 W

Monitoring Connections ALARM

X11, X12	Plug-in terminal strip, 2-pole each
Relay contact	Normal closed contact 1 A / 60 V DC / 30 W

Serial Interfaces

SPB (X1, X2)	2 * RJ45-jack

Protection Earth

PE	2 * FASTON 6.3 mm

Operating Information

Temperature	-40 °C … +85 °C
Relative humidity	5 … 95 % non condensing

- **Digital Input Card – 660BIR01**

Description

16 binary input channels, to be used for single indications, double indications, digital measurands and pulse counters.

- Resolution: 1 ms
- Process voltage: 24...60 V DC
- LED signal for each input

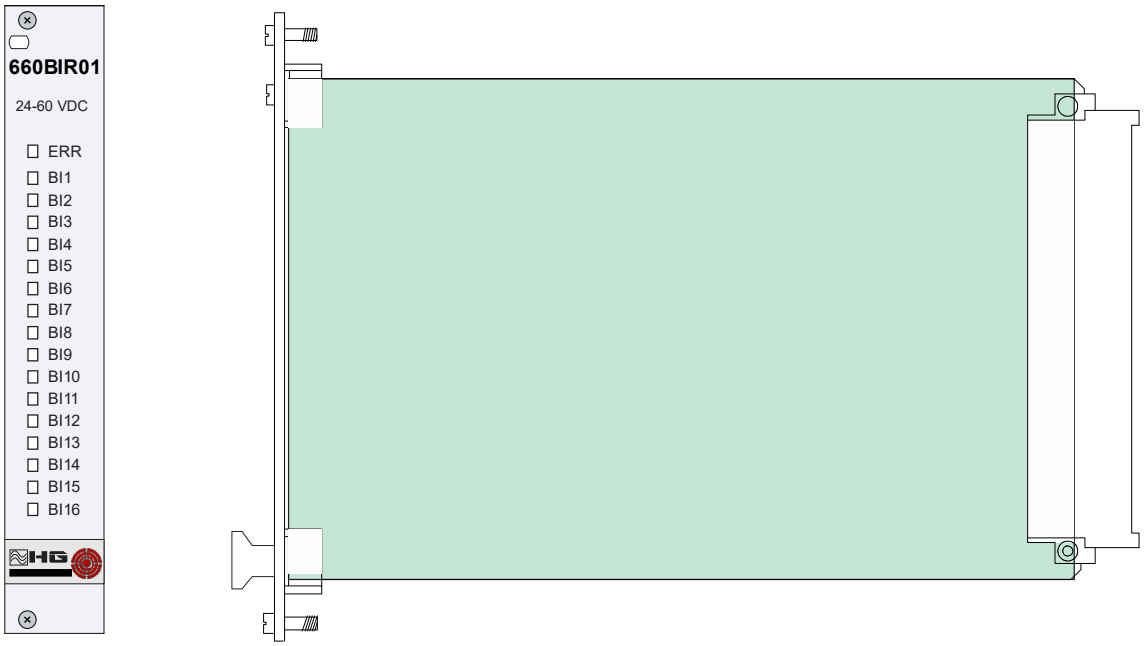

Figure 3. Front and side views of 660BIR01 card

Application

The module 660BIR01 provides 16 galvanic isolated inputs for up to 16 binary process signals. Scanning and processing of the inputs are executed with the high time resolution of 1ms. The allocation of an input signal to the processing functions can be done according to the rules of configuration.

The module 660BIR01 is able to process the following types of signals or a combination of them:

- 16 single point information with time stamp (SPI)
- 8 double point information with time stamp (DPI)
- 2 digital measured values each with 8 bit (DMI8)
- 1 digital measured value with 16 bit (DMI16)
- 16 integrated totals (max. 120 Hz) (ITI)
- 2 step position information each with 8 bit (STI)
- 2 bitstring input each with 8 bit (BSI8)
- 1 bitstring input with 16 bit (BSI16)
  or combinations of these signal types
- LED signaling for each input, common return per 8 inputs.

Technical Data

In addition to the RTU660 general data, the following applies:

Characteristics

Inputs	16 channels, common return for 2 groups of 8 channels, isolated by opto-couplers
Nominal input voltage	24... 60 V DC (+/- 20%)
Max. input voltage	72 V DC
Input current	1.8... 22 mA constant
Logical ‘1’ definitely detected	≥ 18 V DC
Logical ‘0’ definitely detected	≤ 9 V DC
Reverse voltage protection	yes
Max. input frequency for integrated totals	120 Hz

Current consumption for power supplied via RTU660 backplane

5 V DC	100 mA
24 V DC	---

Signaling by LEDs

ERR (red)	Common fault information for the module
1…16	LED displays the active inputs

Mechanical layout

Dimensions	160 mm x 100 mm, 3HE euro card format 4R (20 mm) front panel
Housing type	Printed circuit board
Weight	0.2 kg

Connection type

RTU660 backplane connector	48 pole type F DIN 41612

Environmental conditions

Nominal operating temperature range	-25 °C … +70 °C
Relative humidity EN 60068-2-30	5 … 95 % non condensing

- **Digital Output Card – 660BOR01**

Description

16 binary output contacts to be configured as:

- 1-pole command
- 2-pole command
- 1.5-pole command in configuration with 23BA23
- Operating voltage 24...125 V DC, 60 W
- I_{max}: 2 A <= 30 V DC (ohmic load)

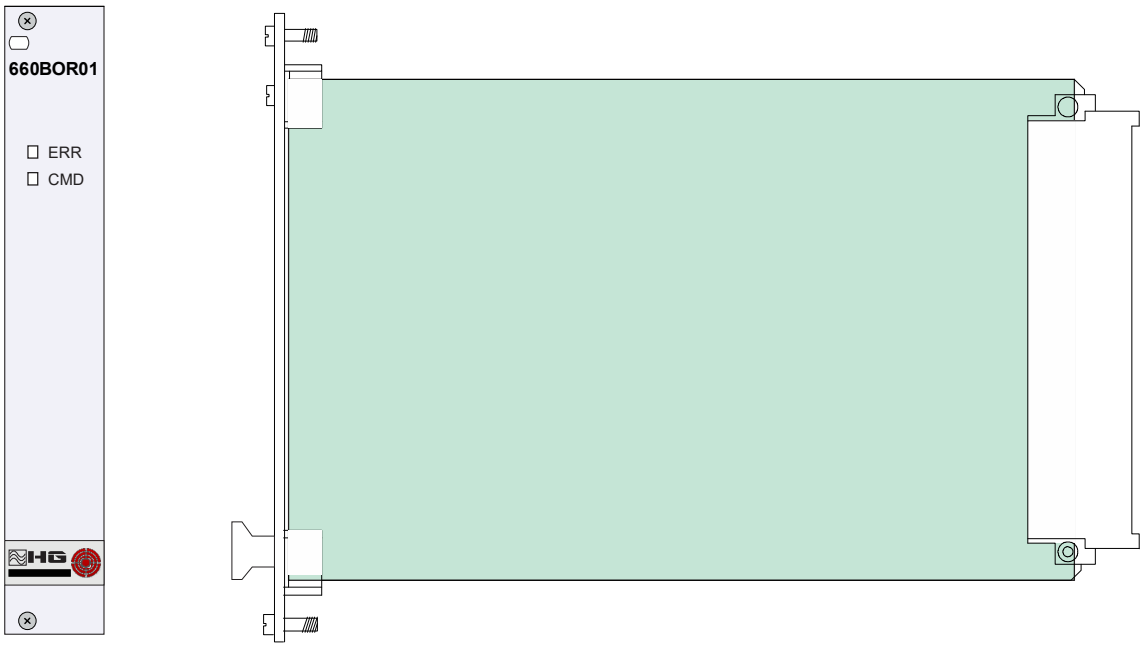

Figure 4. Front and side views of 660BOR01 card

Application

The module 660BOR01 can be used for the control of 16 binary process signals using relay contacts. The allocation of an output signal to the processing functions can be done according to the rules of configuration.

The module 660BOR01 is able to process the following types of signals:

• Single or double commands (SCO or DCO) with 1 or 2 pole output without (1 out of n) check
• Single or double commands (SCO or DCO) with 1.5 or 2 pole output with (1 out of n) check
• Regulation step command (RCO), 1 or 2 pole
• Digital setpoints commands, 8 or 16 Bit with- out strobe (DSO8 or DSO16)
• Digital setpoint commands, 8 or 16 Bit with strobe (DSO8 or DSO16)
• Bitstring output, 1, 2, 8 or 16 Bit (BSO1, BSO2, BSO8 or BSO16)
The module allows switching voltages up to 150 V DC or max. 2 A continuous current.

Technical Data

In addition to the RTU660 general data, the following applies:

Characteristics

Outputs	16 Relay contacts, single pole, normally open, 2 groups of 8 outputs with common return
Nominal switching voltage	150 V DC
Continuous current	2 A total current for one group with the same common return
Max breaking current (resistive load)	2 A ≤ 30 V DC 0.8 A @ 60 V DC 0.15 A @ 150 V DC
Max. breaking capacity (inductive load)	50 VA (L/R= 40 ms)

Current consumption for power supplied via RTU660 backplane

5 V DC	120 mA
24 V DC	10 mA per active relay

Signaling by LEDs

ERR (red)	Common fault information for the module
CMD	Command output, displayed during active output time of any output relay

Mechanical layout

Dimensions	160 mm x 100 mm, 3HE euro card format 4R (20 mm) front panel
Housing type	Printed circuit board
Mounting	for mounting in RTU660 racks
Weight	0.3 kg

Connection type

RTU660 backplane connector	48 pole type F DIN 41612

Environmental conditions

Nominal operating temperature range	-25 °C … +70 °C
Relative humidity EN 60068-2-30	5 … 95 % non condensing
Temperature	-40 °C … +85 °C
Relative humidity	5 … 95 % non condensing

- **Analog Input Card – 660AIR01**

Description

8 measuring channels, to measure process analog values in form of voltage and current with various ranges.

- AD converter resolution: 16 bit
- Measuring ranges: +/-2 mA; +/-5 mA; +/-10 mA; +/-20 mA; +/-40 mA; +/-2 V DC; 0...20 V DC

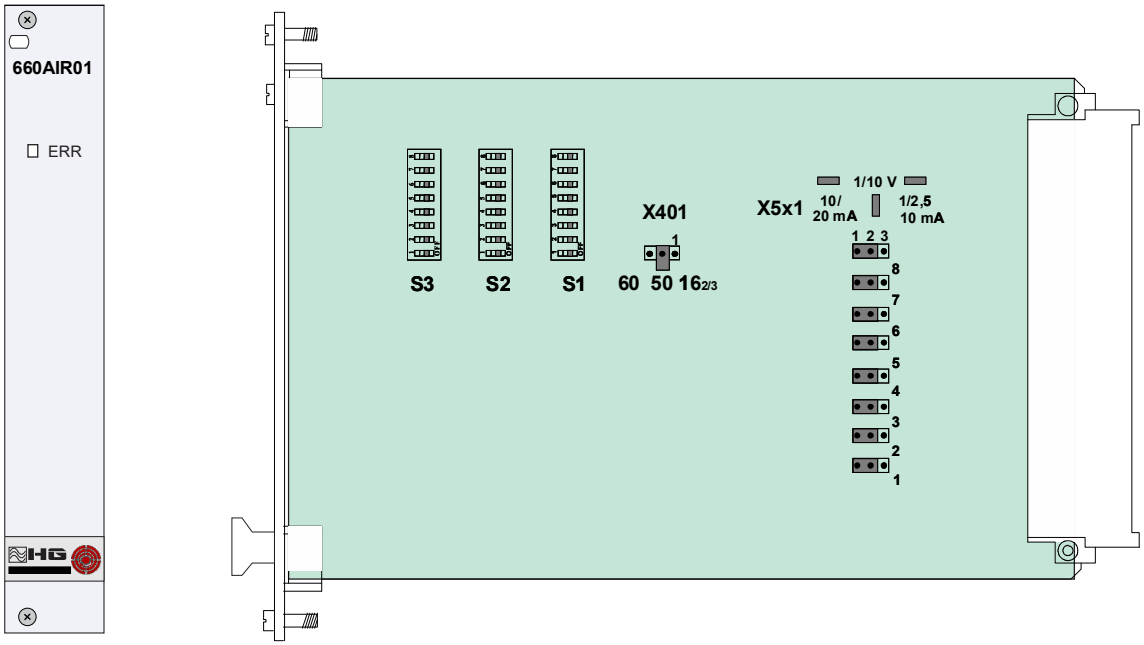

Figure 5. Front and side views of 660AIR01 card, showing jumper settings

Application

The 660AIR01 module records up to 8 analog measured values. The module 660AIR01 is able to process the following types of signals:

- Analog measured values (AMI)
- Measured floating point information (MFI) Following measurement ranges can be configured:
  - ± 2 mA
  - ± 5 mA
  - ± 10 mA
  - ± 20 mA
  - ± 40 mA
  - ± 2 V DC
  - 0... 20 V DC

Other effective ranges and live zero signals become generated out of these ranges through conversion of the communication unit (CMU).

Technical Data

In addition to the RTU660 general data, the following applies:

Characteristics

Inputs	8 differential inputs
Configurable measuring range	• ± 2 mA • ± 5 mA • ± 10 mA • ± 20 mA • ± 40 mA • ± 2 V DC • 0... 20 V DC
Input impedance	150 Ω @ ±2 mA and 5 mA 50 Ω @ ±10 to ±40 mA 110 kΩ @ ±2 and 20 V DC
Max. load	80 mA continuous @ ±10 to ±40 mA 40 mA continuous @ ±2 and ±5 mA 38 V/ 0.5 mA @ ±2 and 20 V DC
Resolution	12 bit + sign 11 bit + sign @ ±2 V DC
AD converter resolution	16 bit
Accuracy at 25 °C	≤ 0.1 % ≤ 0.2 % @ ±2 V DC
Linearity error at 25 °C	≤ 0.1 %
Temperature drift	≤ 100 ppm/K (0... 70 °C)
Max. common mode input voltage	±150 V DC (electrical limit) ±8 V DC (functional limit)
Max. differential input voltage	± 4 V DC (current input) ± 38 V DC (voltage input)
Common mode rejection	> 70 dB @ 25 °C > 60 dB @ 0… 25 °C
Configurable line frequency f_N	• 16.7 Hz • 50 Hz • 60 Hz
Line frequency interference suppression	> 100 dB @ f_N ±2 % > 45 dB @ f_N ±10 %

Current consumption for power supplied via RTU660 backplane

5 V DC	75 mA
24 V DC	---

Signaling by LEDs

ERR (red)	Common fault information for the module

Mechanical layout

Dimensions	160 mm x 100 mm, 3HE euro card format 4R (20 mm) front panel
Housing type	Printed circuit board
Mounting	for mounting in RTU660 racks
Weight	0.3 kg

Connection type

RTU660 backplane connector	48 pole type F DIN 41612

Environmental conditions

Nominal operating temperature range	-25 °C … +70 °C
Relative humidity EN 60068-2-30	5 … 95 % non condensing

- **Analog Output Card – 660AOR01**

Description

Via the analog output board 660AOR01, analog control outputs for sequential or closed loop control, display instruments, measurand recorders etc. can be connected to the RTU660. The 660AOR01board has 2 isolated output channels which can be configured to different output current ranges. The out-put format, unipolar or bipolar resp. Live-Zero (4...20 mA), can be set by software parameters.

The following output current ranges can be configured independently per channel via plug-in jumpers:

- ± 2.5mA
- ± 5 mA
- ± 10 mA
- ± 20 mA (4...20 mA)

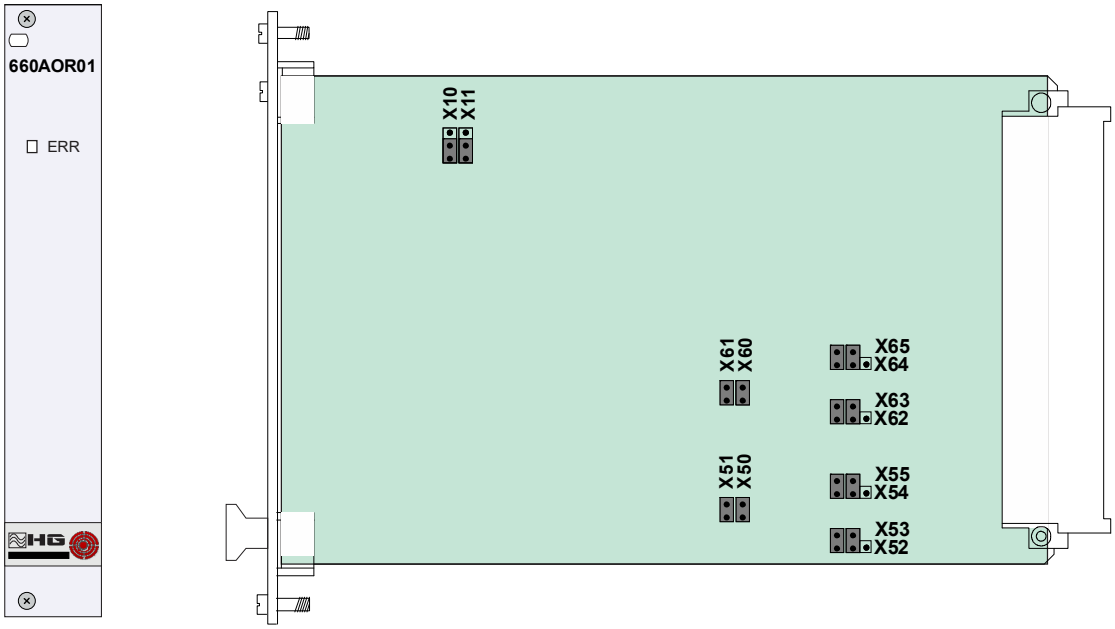

Figure 6. Front and side views of 660AOR01 card, showing jumper settings (20mA)

Application

Each output has a digital to analog converter (DAC) which converts the digital value present in the out-put memory into an analog signal. The DAC has a resolution of 11 bit plus sign. A received output value is stored until a new value is received. The out-put channels are set to 0% after a power up or re-set of the board.

The outputs of the 660AOR01 module are isolated between the channels and from the RTU660 power supply.

The micro-controller on the board carries out the interactive communication with the RTU660 system bus. All configuration data and processing parameters are loaded from the communication unit (CMR) via the RTU660 system bus.

The 660AOR01 module executes a number of tests during initialization and operation. If an error occurs, the central control unit is notified. All error statuses that could affect the function of the module are displayed by a light emitting diode (ERR) as a common fault signal on the front panel. A failure of the board is detected by the communication unit. Analog measured values (AMI)

Technical Data

In addition to the RTU660 general data, the following applies:

Output Channels

Outputs	2
Potential isolation	from one another and against power supply
Output current	± 2,5 mA ± 5 mA ± 10 mA ± 20 mA (4...20 mA)
Range selection	per channel by plug-in jumpers
Load impedance	max. 500 Ω (± 20 mA) max.1000 Ω (±2,5...±10 mA)
Resolution Adjustment	11 bit + sign 2000 Digit = 100% factory-adjusted
Errors:	(Reference: 25 °C)
Gain error ± 20 mA ± 10 mA ± 5 mA / ± 2.5 mA	typ. (%) max. (%) 0.01 0.02 0.01 0.01 0.03 0.2
Offset error ± 20 mA / ± 5 mA ± 10 mA / ± 2.5 mA	typ. (%) max. (%) 0.03 0.1 0.06 0.2
Temperature drift:	(Range: 0…70 °C)
Gain ± 20 mA / ± 5 mA ± 10 mA / ± 2.5 mA	typ(ppm/°C) max(ppm/°C) 100 200 100 200
Offset ± 20 mA / ± 5 mA ± 10 mA / ± 2.5 mA	typ(ppm/°C) max(ppm/°C) 60 300 120 600

Current consumption for power supplied via RTU660 backplane

5 V DC	650 mA
24 V DC	---

Signaling by LEDs

ERR (red)	Common fault information for the module

Mechanical layout

Dimensions	160 mm x 100 mm, 3HE euro card format 4R (20 mm) front panel
Housing type	Printed circuit board
Mounting	for mounting in RTU660 racks
Weight	0.3 kg

Connection type

RTU660 backplane connector	48 pole type F DIN 41612

Environmental conditions

Nominal operating temperature range	-25 °C … +70 °C
Relative humidity EN 60068-2-30	5 … 95 % non condensing

- **Power Supply Card – 660PSR00**

Description

Power supply unit for RTU660 racks, total power 45W.

- Input voltage 24...60 V DC
- Output voltage: 5 and 24 V DC
- Suitable for redundant power supply in 660SFR02

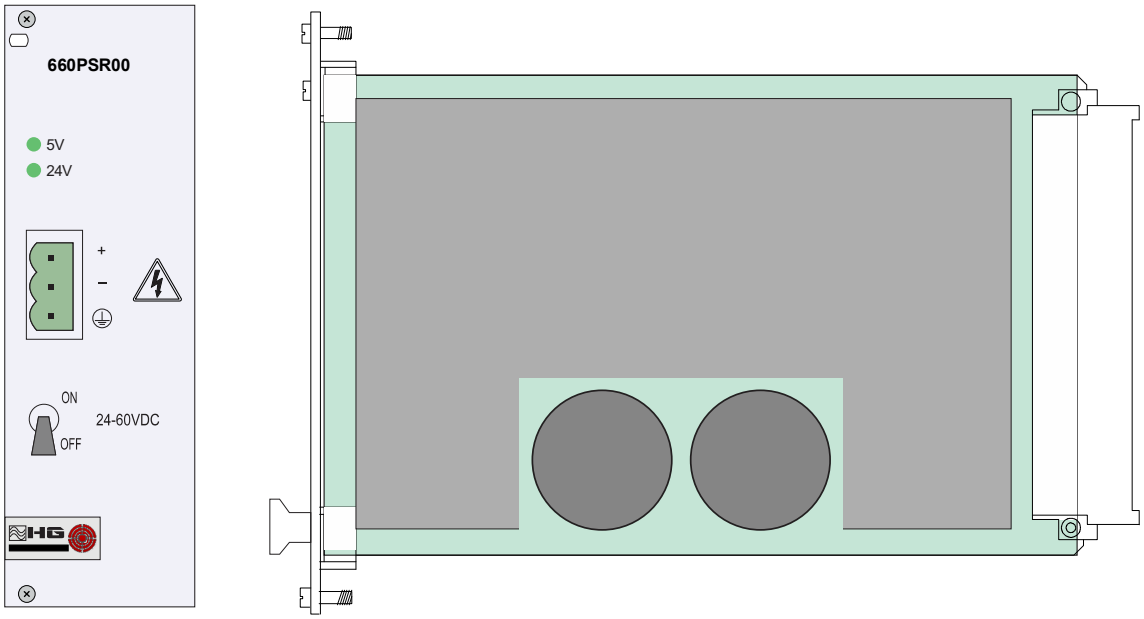

Figure 7. Front and side views of 660PSR00 card, showing jumper settings

Application

The power supply unit 660PSR00 generates the two supply voltages (5 V DC and 24 V DC) for the RTU660 subracks 660SFR02. The output power is sufficient to supply a subrack with up to 4 communication units (CMU).

It is possible to configure redundant power supplies for project configurations with higher requirements to availability. In this configuration two power supply units 660PSR00 are operating in parallel mode. They are able to take over the full load, if one power supply fails. Only power supplies of the same type and rubric should be used for redundant operation.

Technical Data

In addition to the RTU660 general data, the following applies:

Power supply input

Input voltage	24 ... 60 V DC
Input tolerance range	-20%... +15%
Voltage Interruption	≤ 50 ms; 0 % UN (UN ≥ 48V)
Max. input current	2.3 ... 0.9 A
Starting Current	<10 A; 50µs - 1.5ms (Class S1 according to IEC 60870-4)
Efficiency	85%
External circuit-breaker	The plus lead needs a be protected by a circuit-breaker upstream with 10A trip current.
Reverse voltage protection	Yes
Potential isolation between input and outputs	Yes

Power supply output

Total output power	44.3 W
Derating	-2,5 % / Kelvin; ≥ 55 °C

Output U1

Voltage	5.1 V DC
Tolerance	5.0... 5.3 V DC
Current min.	0.2 A
Current max.	5.5 A
Residual Ripple	≤ 30 mV_{ss}

Output U2

Voltage	24 V DC
Tolerance	22.4... 26.3 V DC
Current min.	0 A
Current max.	0.7 A
Residual Ripple	≤ 80 mV_{ss}

Mechanical layout

Dimensions	160 mm x 100 mm, 3HE euro card format 8R (40 mm) front panel
Housing type	Printed circuit board
Mounting	for mounting in RTU660 racks
Weight	0.5 kg

Connection type

RTU660 backplane connector	48 pole type F DIN 41612
Supply connector	3 pole 7.62 mm pluggable screw terminals (included in delivery) 0.2... 2.5 mm²/ AWG 24 - AWG 12

Environmental conditions

Nominal operating temperature range	-25 °C … +70 °C
Relative humidity EN 60068-2-30	5 … 95 % non condensing

- **Communication Module – 660CMR02**

Description

Communication module of the RTU660 with 32-bit CPU.

- 6 x serial communication interface (RS-232 or RS-485) for remote communication
- 2 x Ethernet interface (10/100BaseT)
- 1 x USB port
- 1 x serial peripheral bus
- battery buffered real time clock

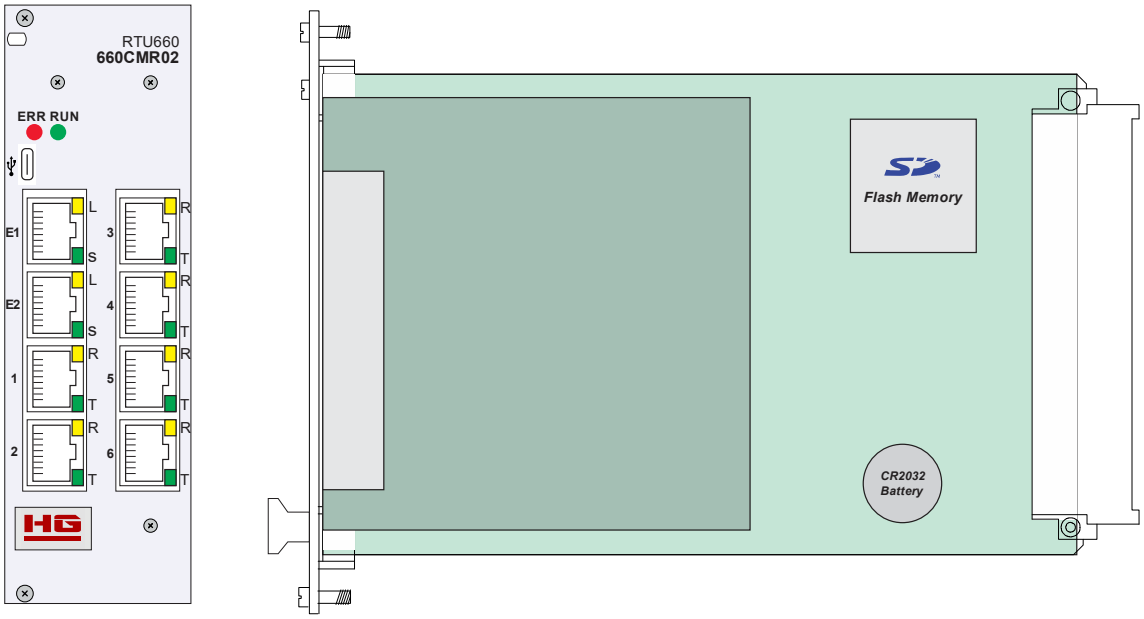

Figure 8. Front and side views of 660CMR02 card

Application

The 660CMR02 communication unit is one of the communication modules of the RTU660 product line. The essential tasks are:

- Managing and controlling of the I/O modules via the interface to 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 interface (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 RTU660 product line station and synchronizing the I/O modules.
- Handling the dialog between RTU660 product line and Web-Browser via the LAN interfaces.

Within the RTU660 racks the board occupies two slots. The communication unit is able to handle Ethernet and UART-character based communication protocols. 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 660CMR02 is responsible for the interface management, the event handling, the time base and the internal data base. The controller acts as master for the SPB I/O bus (serial peripheral bus). RTU560 synchronizes itself to the time references supplied by 660RTC0x. The time information of the 660RTC0x is provided to the 660CMR02 on the backplane of the sub-rack.

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 ... 6 (CP1 ... CP6): serial interfaces according RS232C or RS485 with RJ45 connectors. CP1 and CP2 can be configured independent as SPB I/O bus interface to the front.
- Ethernet interface 1 and 2 (E1 & E2): 10/100BaseT with RJ45 connector.
- USB 2.0 device interface for diagnosis and maintenance purposes.
- The SPB I/O bus is directly connected to the backplane connector.

Technical Data

In addition to the RTU660 general data, the following applies:

Main Processing Unit MPU

CPU	ARM cortex A8, AM3352 @800 MHz
RAM	128 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, 5 and 6

Connector	RJ45	
Type	RS232C or RS485	
RS232C:		
Bit rate	200 bit/s - 38.4 kbit/s	
Signal lines	GND	E2/102
	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

Connector	micro USB Type AB
Type	USB 2.0 device, low, full and high speed (max. 480 MBit/s)
Cable type to PC	USB Type A <-> micro USB Type B

Current consumption for power supplied via RTU660 backplane

5 V DC	600 mA
24 V DC	4 mA

Signaling by LEDs

ERR (red)	ON: RTU in error state Flashing: RTU in warning state For more details see RTU600 series Function Description
RUN (green)	Communication module in operation
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) / Activity (Flashing) on Ethernet interface E

Mechanical layout

Dimensions	160 mm x 100 mm, 3HE euro card format 8R (40 mm) front panel
Housing type	Printed circuit board
Mounting	for mounting in RTU660 racks
Weight	0.19 kg

Connection type

RTU660 backplane connector	48 pole type F DIN 41612

Immunity test

Electrostatic discharge IEC 61000-4-2	8 kV air / 6 kV contact (level 3) Performance criteria A
Radiated Radio-Frequency Electromagnetic Field IEC 61000-4-3	10 V/m (level 3) Performance criteria A
Electrical Fast Transient / Burst IEC 61000-4-4	4 kV (level X) Performance criteria A
Surge IEC 61000-4-5	2 kV (level 3) Performance criteria A
Conducted Disturbances, induced by Radio- Frequency Fields IEC 61000-4-6	10 V (level 3) Performance criteria A
Damped oscillatory wave IEC 61000-4-18	2.5 / 1 kV (level 3) Performance criteria A

Environmental conditions

Nominal operating temperature range	-25 °C … +70 °C
Relative humidity EN 60068-2-30	5 … 95 % non condensing
Max. operating temperature, max. 96h EN 60068-2-2	+85 °C

- **Communication Module – 660CMR01**

Description

Communication module of the RTU660 with 32-bit CPU.

- 2 x serial communication interface (RS-232 or RS-485) for remote communication
- 2 x Ethernet interface (10/100BaseT)
- 1 x USB port
- 1 x serial peripheral bus
- battery buffered real time clock

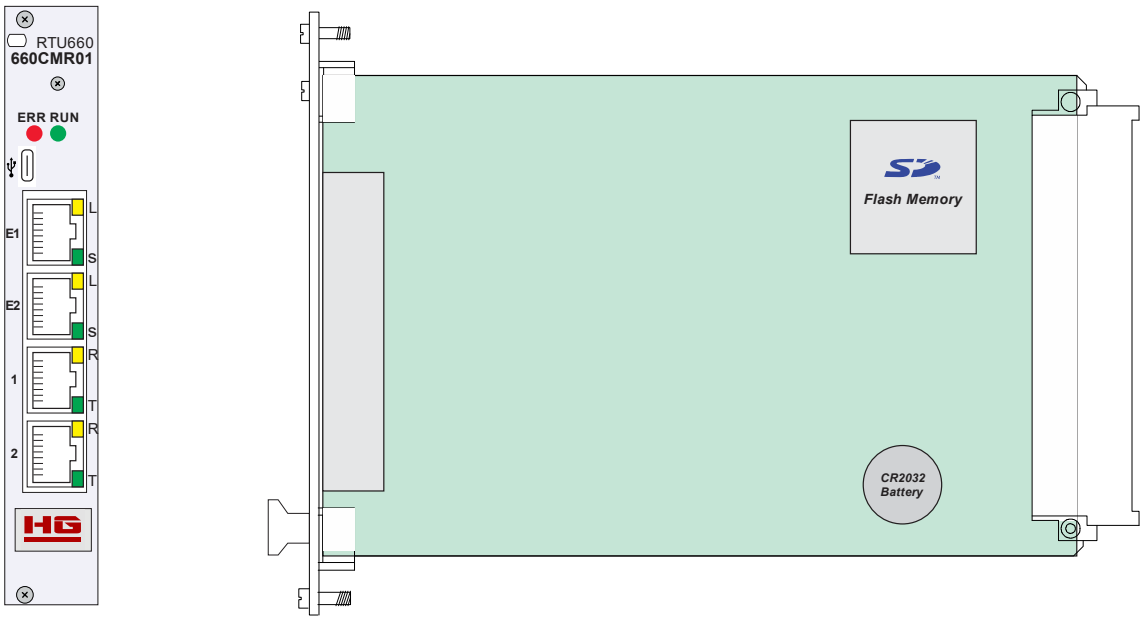

Figure 9. Front and side views of 660CMR01 card

Application

The 660CMR01 communication unit is one of the communication modules of the RTU660 product line. The essential tasks are:

- Managing and controlling of the I/O modules via the interface to 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 interface (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 RTU660 product line station and synchronizing the I/O modules.
- Handling the dialog between RTU660 product line and Web-Browser via the LAN interfaces.

Within the RTU660 racks the board occupies two slots. The communication unit is able to handle Ethernet and UART-character based communication protocols. 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 660CMR02 is responsible for the interface management, the event handling, the time base and the internal data base. The controller acts as master for the SPB I/O bus (serial peripheral bus). RTU560 synchronizes itself to the time references supplied by 660RTC0x. The time information of the 660RTC0x is provided to the 660CMR02 on the backplane of the sub-rack.

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 and 2 (CP1 & CP2): serial interfaces according RS232C or RS485 with RJ45 connectors. CP1 and CP2 can be configured independent as SPB I/O bus interface to the front.
- Ethernet interface 1 and 2 (E1 & E2): 10/100BaseT with RJ45 connector.
- USB 2.0 device interface for diagnosis and maintenance purposes.
- The SPB I/O bus is directly connected to the backplane connector.

Technical Data

In addition to the RTU660 general data, the following applies:

Main Processing Unit MPU

CPU	ARM cortex A8, AM3352 @800 MHz
RAM	128 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 CP1 and CP2

Connector	RJ45	
Type	RS232C or RS485	
RS232C:		
Bit rate	200 bit/s - 38.4 kbit/s	
Signal lines	GND	E2/102
	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

Connector	micro USB Type AB
Type	USB 2.0 device, low, full and high speed (max. 480 MBit/s)
Cable type to PC	USB Type A <-> micro USB Type B

Current consumption for power supplied via RTU660 backplane

5 V DC	500 mA
24 V DC	3 mA

Signaling by LEDs

ERR (red)	ON: RTU in error state Flashing: RTU in warning state For more details see RTU600 series Function Description
RUN (green)	Communication module in operation
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) / Activity (Flashing) on Ethernet interface E

Mechanical layout

Dimensions	160 mm x 100 mm, 3HE euro card format 4R (20 mm) front panel
Housing type	Printed circuit board
Mounting	for mounting in RTU660 racks
Weight	0.14 kg

Connection type

RTU660 backplane connector	48 pole type F DIN 41612

Immunity test

Electrostatic discharge IEC 61000-4-2	8 kV air / 6 kV contact (level 3) Performance criteria A
Radiated Radio-Frequency Electromagnetic Field IEC 61000-4-3	10 V/m (level 3) Performance criteria A
Electrical Fast Transient / Burst IEC 61000-4-4	4 kV (level X) Performance criteria A
Surge IEC 61000-4-5	2 kV (level 3) Performance criteria A
Conducted Disturbances, induced by Radio- Frequency Fields IEC 61000-4-6	10 V (level 3) Performance criteria A
Damped oscillatory wave IEC 61000-4-18	2.5 / 1 kV (level 3) Performance criteria A

Environmental conditions

Nominal operating temperature range	-25 °C … +70 °C
Relative humidity EN 60068-2-30	5 … 95 % non condensing
Max. operating temperature, max. 96h EN 60068-2-2	+85 °C

All data provided in this document is subject to alteration.

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