

Introduction

HG-660TST: Remote Terminal Unit (RTU) Test and Simulation Equipment

As a part of substation automation test and simulation product for transmission and sub-transmission, HG introduces HG-660TST which represents different state of the art I/O test modules, along with high end test subrack with flexible and easy-to-use interfaces. Designed to handle the highly complex systems in grid automation and control interfacing. HG-660TST can test and simulates any I/O card compatible with ABB RTU560 I/O modules, like BIR, AIR and BOR cards.

In the current document, a brief introduction of the HG-660TST basic modules will be presented, as well as corresponding technical specifications.

- **Main Subrack – 660TST01**

Description

660TST01 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. The connection between each I/O card installed in 660TST01 subrack and test modules, are implemented through 20-pin IDC connectors on top of subrack (marked with SLOT 1 ~ 18)

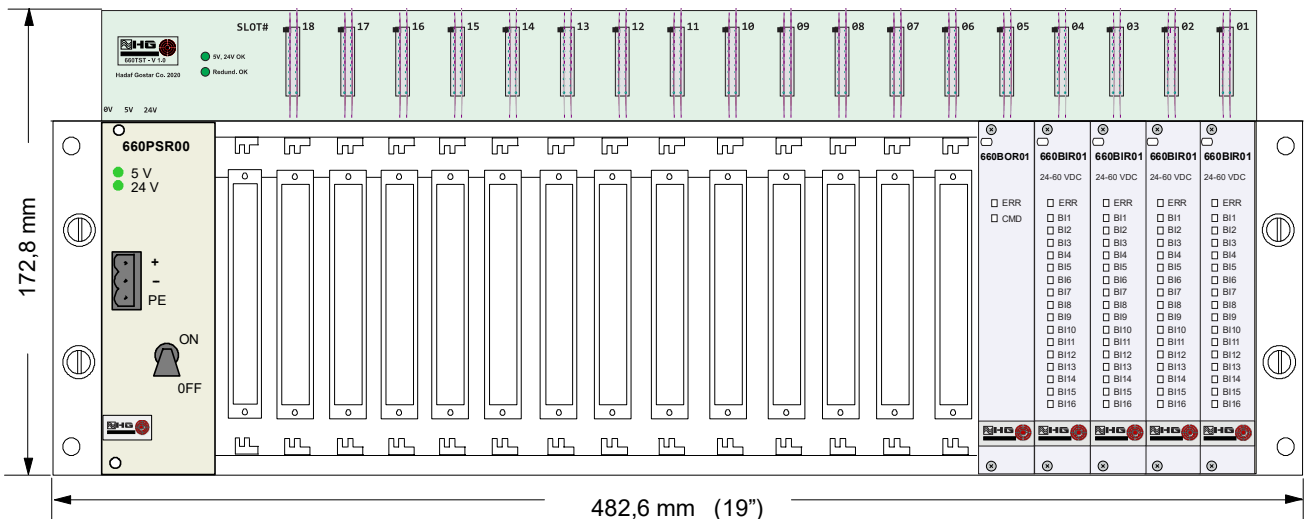


Figure 1. Front view of 660TST01 subrack

Application

The 660TST01 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 HG-660TST serial peripheral bus.

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.

Technical Data

In addition to the HG-660TST general data, the following applies:

Rack

	19", 3 HE, 20 slots according DIN 41494 1 slot = 20.32 mm
Dimensions	172,8 x 482,6 x 210 mm (H x W x D)
With boards	232 mm (D)
With boards and connector	280 mm (D)
Weight	3.3 kg

Printed Circuit Board

Dimensions	433.7 x 172.8 mm (W x H)
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Type of Connection

Peripheral boards	Indirect, 48 pole, Type F DIN 41612
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Power Supply Monitoring

Green LED1	ON: 5V and 24V OK
Green LED2	ON: Redundant Power Supply OK

Serial Interfaces

SPB (X1, X2)	2 * RJ45-jack
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Protection Earth

PE	2 * FASTON 6.3 mm
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Operating Information

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

• **Digital Input Card Test Module – 660BIT01**

Description

16 push buttons, to be used for testing of single or double indications on digital input cards.

- Jumpers for simulation of constant-ON indication on each channel
- Process voltage: 24 V DC nominal, or external reference voltage can be applied
- LED signal for each input

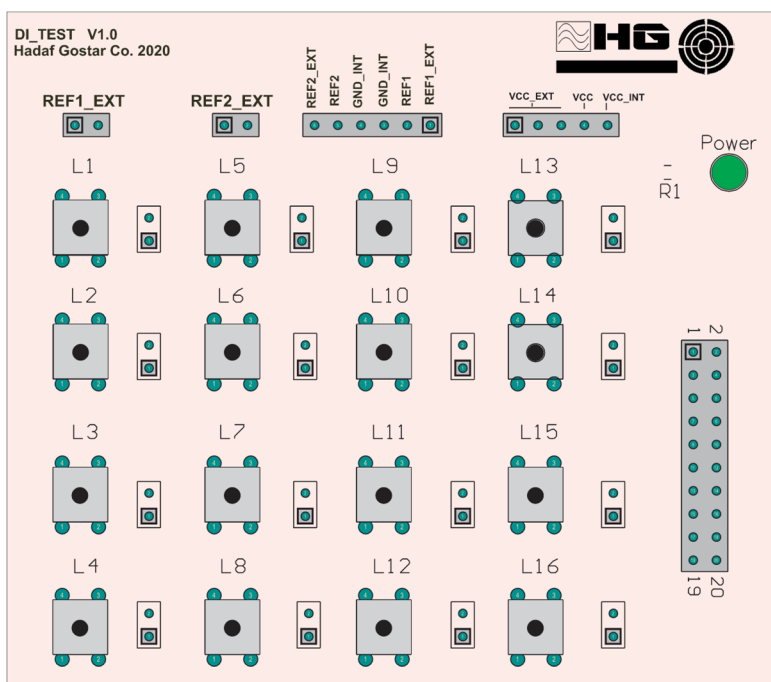


Figure 2. Top view of 660BIT01 module, showing jumper settings

Application

The module 660BIT01 provides 16 push buttons, simulating 16 binary process signals. Each push button has two pin-header nearby, which can be shorted by means of a jumper. In this way, a constant-ON signal will be simulated on the according input channel.

The required power for this module is supplied through cable connection by 660TST01 subrack.

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

- 16 single point information (SPI)
- 8 double point information (DPI)

Technical Data

In addition to the HG-660TST general data, the following applies:

Characteristics

Input simulation points	16 channels
Nominal input voltage	24V DC
Variable input voltage	Through pin-header and jumper setting on PCB

Current consumption for power supplied via HG-660TST01 backplane

5 V DC	---
24 V DC	10 mA per active command

Signaling by LEDs

Green LED	Connection to 660TST01 OK, power ON
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Mechanical layout

Dimensions	85 mm x 74 mm, With 4 spacer stands
Housing type	Printed circuit board
Weight	0.1 kg

Connection type

HG-660TST01 backplane connector	IDC, 20-pin header connector, via Ribbon cable
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Environmental conditions

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

• **Digital Output Card Test Module – 660BOT01**

Description

16 binary indicators (LEDs) to be used for testing of 1-pole or 2-pole commands on digital output cards.

- Command simulation voltage: 24 V DC nominal, or external reference voltage can be applied
- LED signal for each command

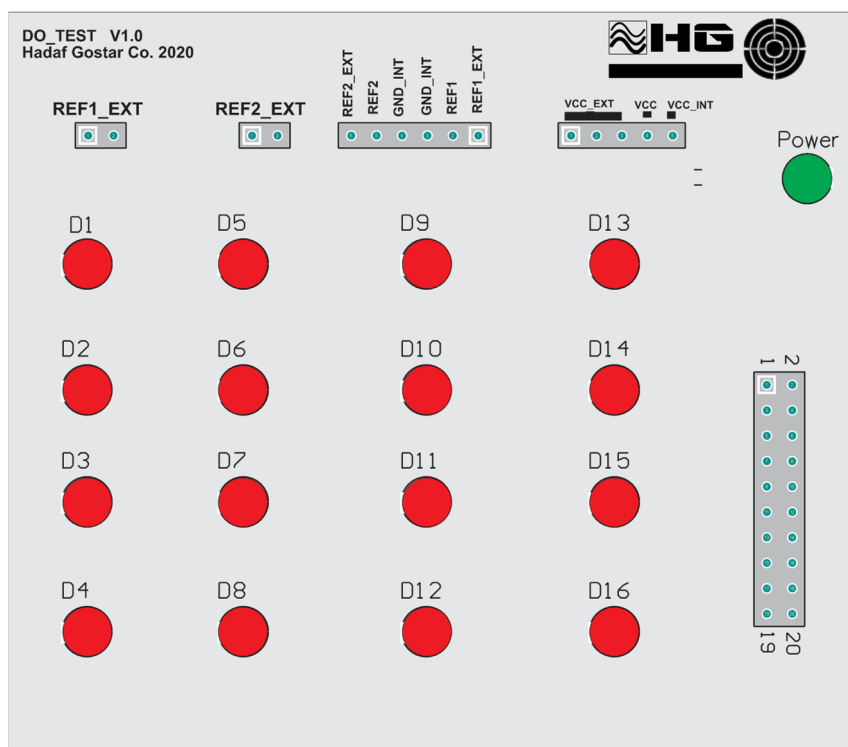


Figure 3. Top view of 660BOT01 module, showing jumper settings

Application

The module 660BOT01 can be used for the test of 16 binary process command outputs. The allocation of an output signal to the processing functions can be done according to the rules of configuration.

The required power for this module is supplied through cable connection by 660TST01 subrack.

The module 660BOT01 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

Technical Data

In addition to the HG-660TST general data, the following applies:

Characteristics

Output simulation points	16 channels
Nominal input voltage	24V DC
Variable input voltage	Through pin-header and jumper setting on PCB
Max. input voltage	72 V DC

Current consumption for power supplied via HG-660TST01 backplane

5 V DC	---
24 V DC	10 mA per active command

Signaling by LEDs

Red LEDs	Activation of a command on the I/O module under test
Green LED	Connection to 660TST01 OK, power ON

Mechanical layout

Dimensions	85 mm x 74 mm, With 4 spacer stands
Housing type	Printed circuit board
Weight	0.1 kg

Connection type

HG-660TST01 backplane connector	IDC, 20-pin header connector, via Ribbon cable
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Environmental conditions

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

• **Analog Input Card Test Module – 660AIT01**

Description

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

- Fine and Coarse precision potentiometers, for generation precise voltage and currents
- Analog ranges: +/- 2 mA; +/-5 mA; +/-10 mA; +/-20 mA; +/-40 mA; +/-2 V DC; 0...20 V DC

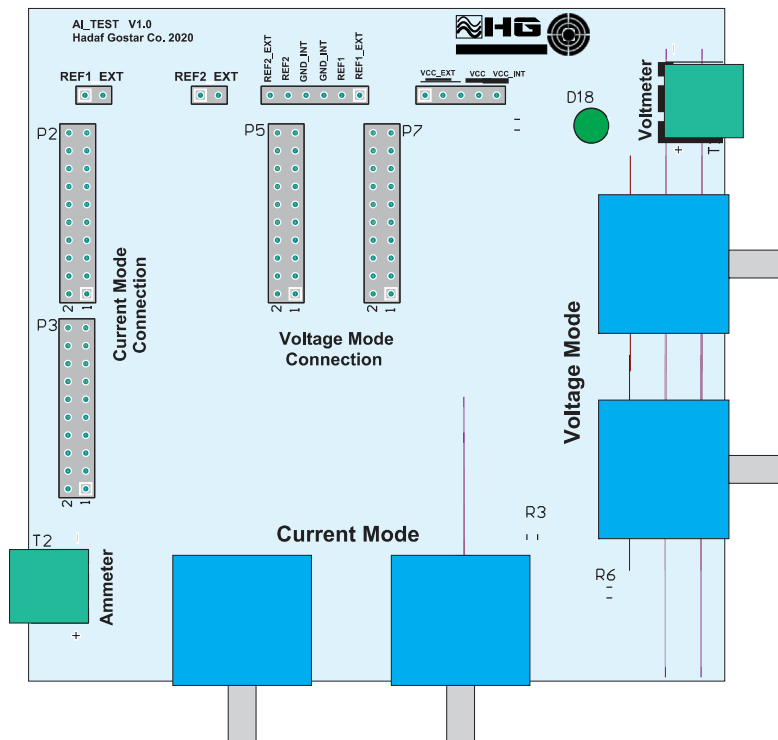


Figure 4. Top view of 660AIT01 card, showing jumper settings

Application

The 660AIT01 module generates 8 identical analog voltage or current values. These values available on one of the 20-pin IDC connectors, based on voltage or current operating mode. Each connector can feed one Analog Input (AI) card with 8 channels, installed inside 660TST01 subrack.

The module 660AIT01 is able to feed the following types of analog signals:

- Analog measured values (AMI), Following analog ranges can be utilized:
 - 2 mA
 - 5 mA
 - 10 mA
 - 20 mA
 - 2 V DC
 - 0... 10 V DC

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

The required power for this module is supplied through cable connection by 660TST01 subrack.

Technical Data

In addition to the HG-660TST general data, the following applies:

Characteristics

Outputs	8 identical analog outputs, voltage or current
Configurable feeding range	<ul style="list-style-type: none"> • 2 mA • 5 mA • 10 mA • 20 mA • 2 V DC • 0... 10 V DC
Resolution	2 precision potentiometers for each mode (Coarse and Fine), each has 10-turn for full scale (3600°)

Current consumption for power supplied via HG-660TST01 backplane

5 V DC	---
24 V DC	Max. 25 mA for current mode, Max. 5 mA for Voltage mode

Signaling by LEDs

Green LED	Connection to 660TST01 OK, power ON
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Mechanical layout

Dimensions	99 mm x 96 mm, With 4 spacer stands
Housing type	Printed circuit board
Weight	0.2 kg

Connection type

HG-660TST01 backplane connector	IDC 20-pin header connector, via Ribbon cable
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Environmental conditions

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

NOTE: An ammeter should be connected to the board in “Current Mode”, otherwise the current path would not be closed and the AI card cannot show any measurement. If Ammeter is not available, its connection should be short-circuited.

- **Analog Output Card Test Cable – 660AOC01**

Description

This test and simulation cable connects the 2 channels of an analog output card, to 2 channels of an analog input card, both installed on two different slots of 660TST01 subrack. In This way, the output analog values of AO card can be measured by the AI card accordingly. The cable connects two relevant 20-pin IDC connectors on 660TST01 subrack.

AO channel #1 is connected to AI channel #4, and AO channel #2 is connected to AI channel #1.

NOTE: Two ends of this cable are **not** identical, care should be taken during cable installation. Each end has the proper label to show AI or AO connection.

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