Station Computer COM615

Product Guide

Features

- Single-line diagram (SLD)
  - All primary SLD devices are displayed in one screen. The SLD recognises different voltage levels and different busbar systems, for example, single busbar, double busbar, duplex systems, etc. The SLD can include a Local/Remote selection switch indication. SLD can be used to view any available measured values from the process devices. Alarm and generic indication symbols can be placed in the SLD. Generic control buttons can further be added to control objects.

- BusBar colouring
  - Four different modes of BusBar colouring are available. The colours represent the busbar status. The colouring is freely configurable.

- Alarms and Events
  - Alarms and Events are identified by the following identifications: Date, Time, Bay, Device, Object Description and Status. Alarms and Events can be automatically filtered according to the voltage level or bay criteria. The maximum memory capacity is 65535 events. First-in, first-out logic is used for overwriting events.The user can export an event list to a .csv file for further analysis.

- Control
  - A separate control dialog is used for controlling the switching device. It provides information on switching device identification, reservation status and interlocking conditions. The *select before execute* logic is used to prevent malfunction. By reserving the switching device for only one user the risk of controlling the device from two different locations is eliminated. Tap changer function for RET 54_ is supported.

- Freely defined web links
  - The user can define web links during run time. This applies to any switching device.

- Measurements
  - Measured values from process devices are displayed on the Human Machine Interface (HMI).

- Disturbance Recorder upload
  - The protection and control IED generates disturbance records that can be uploaded from the HMI for further analysis.
  - The supported format is COMTRADE via IEC 61850-8-1.

- Parameter setting
  - The Parameter setting tool can be used for viewing and/or setting the parameters in IEDs supporting transparent SPA or IEC 61850 parameterization.

- System diagnostic
  The communication diagnostic of each network level component is supervised. This includes process devices.

- User management
  There are four different types of user: Viewer, Operator, Engineer and Administrator.

- National language support
  - The HMI can be translated to any language with the assistance of ABB Oy, Distribution Automation.

- Microsoft Internet Explorer with Adobe SVG viewer 3.03 is needed for using the HMI.

- Protocol conversion gateway for substation automation:
  - Process communication: LON-LAG, SPA, IEC 60870-5-103, IEC 61850-8-1, Modbus serial , Modbus TCP, DNP3 serial, DNP3 TCP
  - Remote communication: IEC 60870-5-101, IEC 60870-5-104, DNP 3.0 Serial, DNP 3.0 LAN/WAN, SPA Router, External OPC Client (DA, AE)

  True IEC 61850 communication gateway:
  - IEC 61850-6 - Substation Configuration Language (SCL)
  - IEC 61850 -7 - Communication modeling and cross-referencing between protocols
  - IEC 61850-8-1 - Mapping for MMS-TCP/IP – Ethernet

  Configuring:
  - Efficient and intuitive configuration tool
  - Cross-referencing between protocols based on the IEC61850-7 models
  - Drag-and-drop protocol mapping to map complete structures from the source data

- Efficient handling of large amounts of data in list views
- Tooltips
- Remote configuration and administration

• Communication redundancy (requires optional LAN card)
  - IEC 62439/PRP (parallel redundance protocol)
  - SFT (switch fault tolerance)

• MNS iS connectivity
  - Connectivity to ABB's Low Voltage Motor Control Center MNS iS with an OPC server in COM600. COM600 receives data from the MNS iS devies and provides HMI and gateway functionality

• Extensive support for commissioning and diagnostics:
  - Online diagnostics for different components

- Communication diagnostic counters on the network and device level
- Real time process data monitoring and controlling for all devices and protocols
- Source data monitoring and simulation:
  - Testing the data mapping for NCCs also with no online IEDs
  - Simulating complete IEDs
- Communication diagnostic event list for all devices and protocols:
  - Resembles a high level protocol analyser
  - Monitors the reported values and events and the received control commands

• Security:
  - User authentication
  - Individual user accounts
  - Password authentication
  - Role-based access control
  - Host-based firewalls
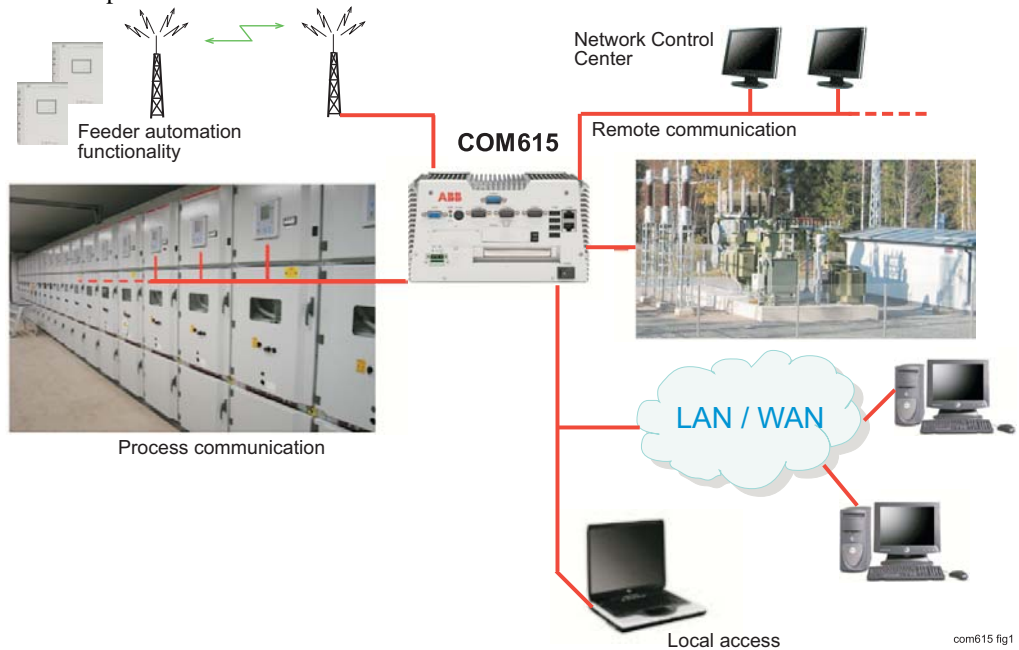 - Communication encryption - HTTPS

Application

Station computer COM615 combines the features and functionality of Control and Monitoring Unit COM 605 and Communication Gateway COM 610. COM615 provides gateway functions for mapping signals between protection and control IEDs in industrial or utility substations and higher-level systems, and an HMI (Human Machine Interface) that provides an interface, data and information from the substation to the users. COM615 gathers the data from protection and control products, and also from process devices using different protocols. COM615 uses web tech-

nology to display data to different users in a professional and user-friendly manner. COM615 uses web technology and transferred to Network Control Centre (NCC) or Distributed Control System (DCS).

Fig. 1 displays an overview of a typical utility system with the COM615 Station.

Fig. 2 displays an industrial system overview.

Feeder automation functionality

Process communication

COM615

Network Control Center

Remote communication

LAN / WAN

Local access

com615 fig1

Application (cont´d)

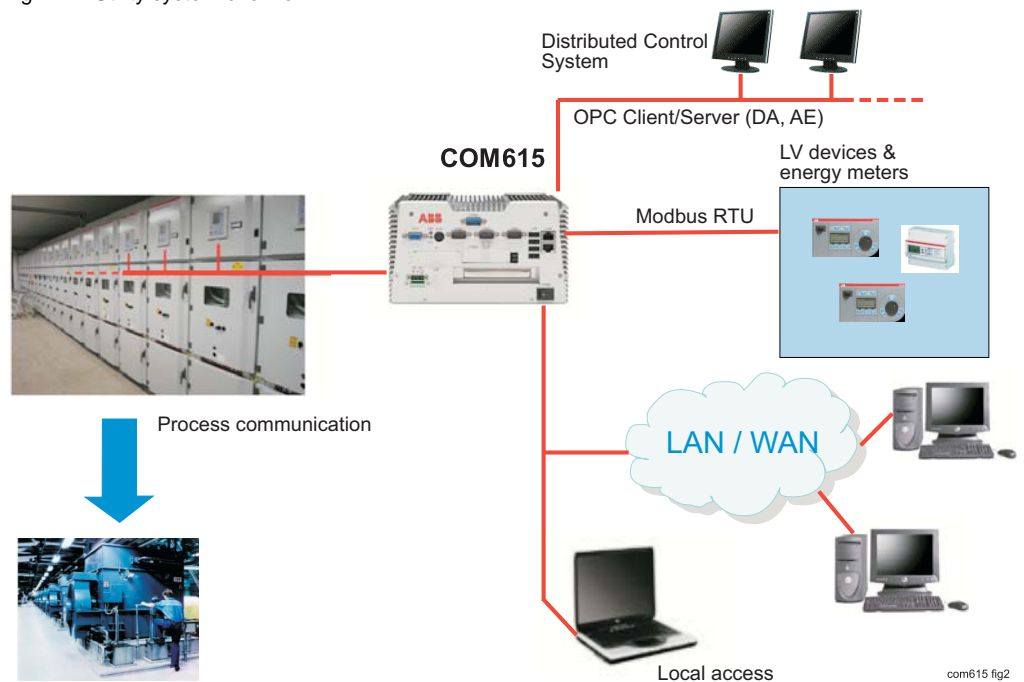Fig. 1   Utility system overview

Fig. 2   Industrial system overview

The supported protocols can be combined freely in one station computer, limited only by the number of hardware interfaces.

Example:

COM615 has four serial ports That allows a maximum of four connections using a serial protocol, for example, 3 SPA + 1 IEC_101 or 2 SPA + 1 IEC_103 +1 IEC_101, etc.

The LON-LAG protocol uses a specific board to connect the fibres, both plastic and glass. COM615 can have one board, that is, one LON line.

It is possible to extend COM615 by increasing the number of Ethernet interfaces. This increases the number of Ethernets lines.

Connectivity Packages

To make the configuration of COM615 more efficient, connectivity packages are available for ABB's protection and control IEDs. A connectivity package includes descriptions of the data and signals available in the IED, and the descriptions are used to automatically configure the master communication in the COM615 3.2 gateway.

Connectivity packages for some IEDs are already available, and more will be released in due couse. At present the following connectivity packages are available:

-   REF 541/3/5, REM 543/5, RET 541/3/5
-   REF 542plus
-   REX 521
-   RE_610
-   SPACOM (Conn Pack v. 2.0 supports SPAJ 140, SPAJ 141, SPAJ 142, SPAJ 144, SPAD 346, SACO 16D1, SACO 16D2, SACO 64D4)

COM615 station computer's configurability and functionality depends on the type of communication protocol used for communication between the COM615 and the IEDs. For more details, please refer to the document "Protocols versus Functions for IEDs", 1MRS756223.

Design

COM615 station computer consists of the OPC Data Access (DA, AE) server and client components. The OPC Servers provide the master/client protocol stacks access to the data in the devices connected with the protocol. The OPC Clients are used for slave/server protocol stacks to enable external systems to access data available in the OPC Servers. They are also used for exposing data to embedded web server to enable external clients, connected to the COM615 over LAN/WAN networks, to access data available in the web server.
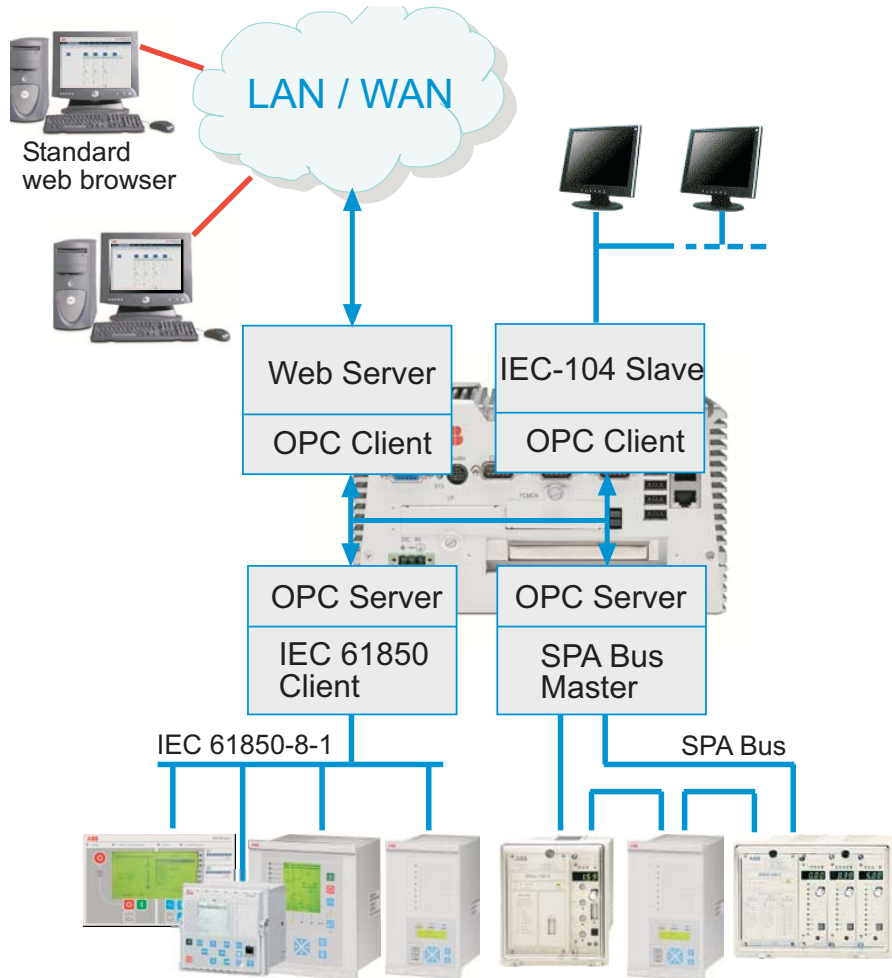
com615 fig 3

Fig. 3   Example of COM615 Station Computer

Available protocols

The table below displays the protocols supported by COM615 station computer. New protocols will be available according to the market demands.

The process communication uses the master protocols. For more detailed information on the protocols, refer to the User's guides listed in *References.*

Master	Slave
LON - LAG	IEC 60870-5-101
SPA	IEC 60870-5-104
IEC 60870-5-103	DNP 3.0 Serial
IEC 61850-8-1	DNP 3.0 LAN/WAN
Modbus serial	SPA Router
Modbus TCP	External OPC Client

DNP3 Serial	
DNP3 TCP	

System requirements for the Communication Engineering Tool

Hardware requirements

The Communication Engineering Tool runs on Microsoft® Windows® XP. A PC capable of running this program is usually sufficient also for running the Communication Engineering Tool.

Microsoft® .NET Framework 2.0 is required for running the Communication Engineering Tool.

It is automatically installed during the installation of the Communication Engineering Tool if it is not already available on the PC.

- Free hard disk space required: minimum 500 MB, recommended 1 GB.

Technical data

Hardware Design

- Ruggedised mechanics
  - No moving parts - no fans, no hard disks
- System
  - Intel® Pentium® M 1.6 GHz
  - 1 GB SDRAM system memory
  - 2 GB Industrial SSD compact flash memory
- Power supply units:
  - 76-240 V dc
- Interfaces
  - 3 RS 232 serial ports
  - 1 RS 232/485 serial port
  - 2 10/100Base-TX RJ-45 connector
  - 4 USB 2.0 ports

- Optional PCI extensions:
  - 1 LON interface (Operating temperature 0°C - +70°C)
  - 8 RS232/485 serial interfaces (Operating temperature 0°C - +55°C)
  - 2 10/100/1000Base-TX RJ-45 connectors (Operating temperature 0°C - +60°C)
- Mechanics and environment:
  - Operation -25°C to +70°C
  - Storage -40°C to +70°C
  - Dimensions (without fastening brackets): 214 mm (W) x 122,5 mm (H) x 313 mm (D)
  - Net weight: 6.8 kg
  - Degree of protection: IP 4x
  - Operating humidity: 5-95% at +40°C, non-condensing
  - EMC CE/FCC class B
  - Anti-vibration and anti-shock tests

Mounting   COM615 is attached with four screws.   Refer to Fig. 3 below.
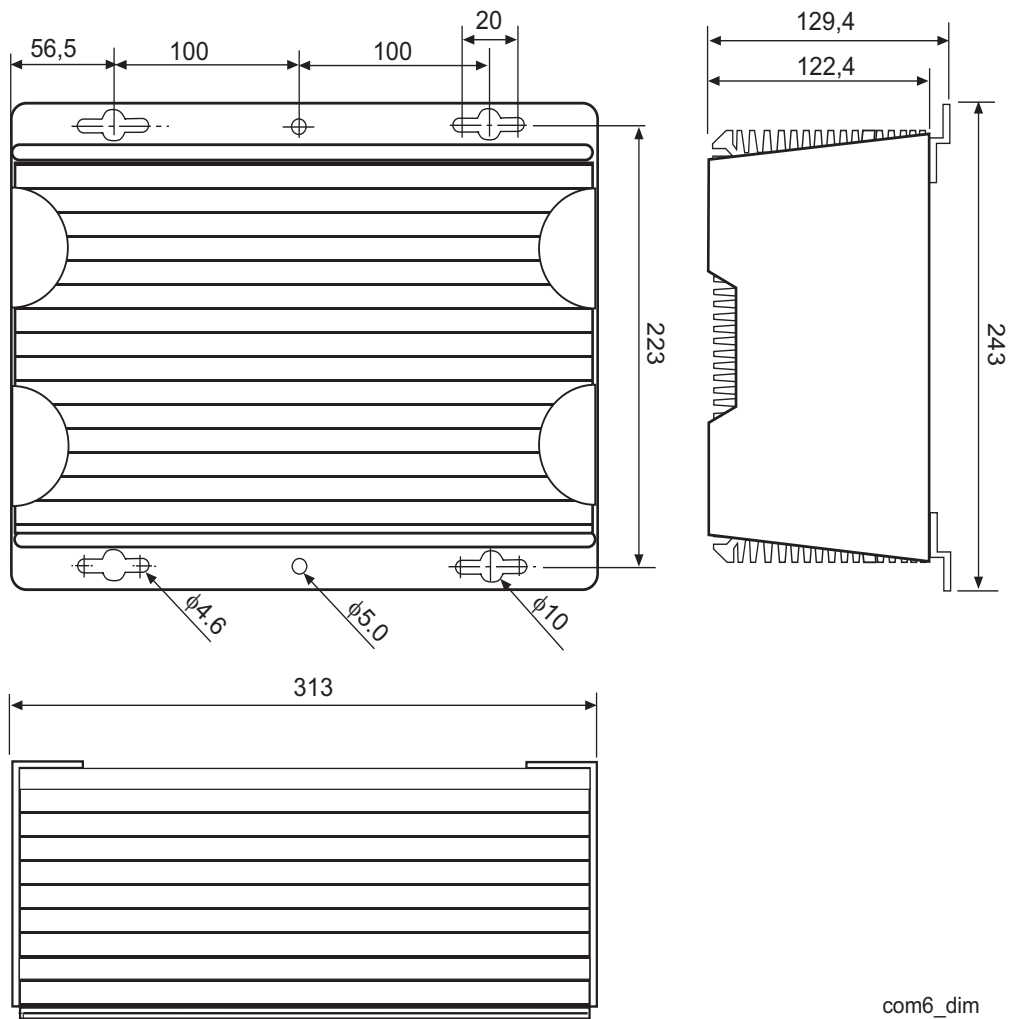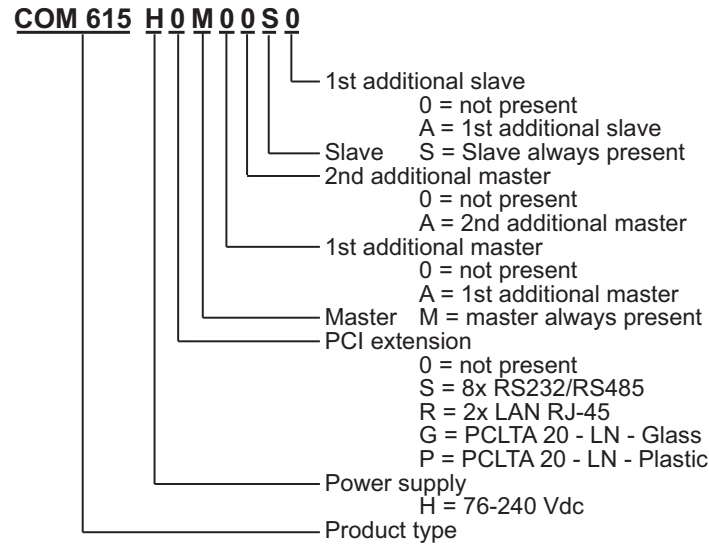
Fig. 4   COM615 mounting dimensions

com6_dim

Ordering

When ordering COM615, use Fig. 5 to generate the correct ordering code.

The ordering code specifies the HW and the SW. If you need an additional PCI card, specify it by selecting the corresponding letter. The

standard delivery of a COM615 unit includes one communication protocol for the process devices and one communication protocol for a higher-level system as well as an HMI Web Server.

Fig. 5   COM615 ordering code

Also specify in the ordering code:

- if you need to gather data from a substation using two or three different protocols.

- if you need to send data from COM615 using two different protocols.

You do not need to specify the protocols in the order. The protocols needed are selected when the COM615 unit is configured. COM615 is

limited only by the number of the slaves and masters ordered. When ordering, please state language, simplified Chinese or Russian, if not English which is the default language.

For more information about ordering and availability, please contact ABB Oy, Distribution Automation.

References

The product documentation is included on the Communication Engineering Tool CD-ROM.

You can also download the latest documents from the www.abb.com/substationautomation.pe tests

COM600 3.2, User's Guide	1MRS756125
COM605 3.2, Operator's Guide	1MRS756121
COM610 3.2, Operator's Guide	1MRS756122
COM615 3.2, Operator's Guide	1MRS756123
COM605, 615 3.2 HMI Configuration Manual	1MRS756124
LON-LAG Master (OPC) 3.2	1MRS755284
SPA Master (OPC) 3.2	1MRS752275
SPA Router (OPC) 3.2	1MRS755497
Modbus Serial Master (OPC) 3.2	1MRS756126
Modbus TCP Master (OPC) 3.2	1MRS756445
IEC 60870-5-103 Master (OPC) 3.2	1MRS752278
IEC 61850 Master (OPC) 3.2	1MRS755321
External OPC Client Access 3.2	1MRS755564
IEC 60870-5-101 Slave (OPC) 3.2	1MRS755382

IEC 60870-5-104 Slave (OPC) 3.2	1MRS755384
DNP 3.0 Serial Slave (OPC) 3.2	1MRS755495
DNP 3.0 LAN/WAN Slave (OPC) 3.2	1MRS755496
DNP 3.0 Serial Master (OPC) 3.2	1MRS756567
DNP 3.0 LAN/WAN Master (OPC) 3.2	1MRS756566
MNS iS Connectivity (OPC) 3.2	1MRS756569

Type tests

Table 1: Inspection of mechanical structure

Description	Reference
Markings and mechanical structure	IEC 60255-5, -6
Degree of protection by enclosure	IEC 60529
Clearance and creepage distances	IEC 60255-5

Table 2: Power supply module tests

Description	Reference
Auxiliary voltage	IEC 60255-6
Aux. voltage interruptions	IEC 60255-11
Ripple in auxiliary dc voltage	IEC 60255-11 12%, f = 2 x fn
Power consumption	CE EN 61010

Table 3: Insulation tests

Test	Reference	Requirement
Dielectric test	IEC 60255-5	2 kV, 50 Hz for 1 minute
Impulse voltage test	IEC 60255-5	5 kV, 1.2/50 μs, 0.5 J
Insulation resistance	IEC 60255-5	>100 MΩ, 500 Vdc
Protective bonding impedance	IEC 60255-27	<0.1 Ω.

Table 4: Electromagnetic compatibility tests

Test	Reference	Requirement
1 MHz burst test	IEC 60255-22-1	- differential mode: 1 kV - common mode: 2.5 kV
ESD	IEC 61000-4-2 IEC 60255-22-2	- contact discharge: 6 kV - air discharge: 8 kV
RF field immunity	IEC 61000-4-6	3 V/m (80% amp.mod.) f = 80 MHz...1000 MHz 30 V/m (pulse mod.) f = 900 MHz
Fast transient	IEC 61000-4-4 IEC 60255-22-4	Power supply: common mode 4 kV: - current inputs CT1…CT5 - voltage inputs VT1…VT4 - sensor inputs (coupling clamp) Power outputs: common mode 2 kV: - signal outputs - digital inputs - IRF relay
Surge	IEC 61000-4-5 IEC 60255-22-5	4 kV line to earth /2 kV line to line - power supply - current inputs CT1…CT5 - voltage inputs VT1…VT4 - power outputs 2 kV line to earth /1 kV line to line - signal outputs - digital inputs - IRF relay
Conducted radio frequency disturbance	IEC 61000-4-6 IEC 60255-22-6	10 V (80% ampl. mod.) f = 150 kHz...80 MHz

Table 4: Electromagnetic compatibility tests

Test	Reference	Requirement
Power frequency (50 Hz) magnetic field	IEC 61000-4-8	300 A/m, continuous
Voltage dips and short interruptions	IEC 61000-4-11	30% reduction for 10 ms 60% reduction for 100 ms 60% reduction for 1000 ms >95% reduction for 5000 ms
Emission test	EN 55011 IEC 60255-25	class A

Table 5: Climatic environmental tests

Test	Reference	Requirement
Dry heat test	IEC 60068-2-2	+55°C, 96 hours +70°C, 4 hours
Cold test	IEC 60068-2-1	-10°C, 96 hours -25°C, 4 hours
Damp heat, cyclic	IEC 60068-2-30	+25°...55°C, Rh > 93% 6 cycles (12h+12h)
Storage	IEC 60068-2-48	+70°C, 72 hours -40°C, 72 hours

Table 6: Mechanical tests

Test	Reference	Requirement
Vibration tests	IEC 60068-2-6 IEC 60255-21-1	Vibration response test: - f = 10...150 Hz - ± 0.035 mm, 10…58 Hz - 5 m/s^2, 58…150 Hz
		Vibration endurance test: - f = 10...150 Hz - ± 0.075 mm, 10…58 Hz - 10 m/s^2, 58…150 Hz
Shock and bump tests	IEC 60068-2-27 IEC 60068-2-29 IEC 60255-21-2	Shock response test: - peak acceleration: 5 x g_n - pulse duration: 11 ms - numbers of pulses in each diretion: 3 Shock withstand test: - peak acceleration: 15 x g_n - pulse duration: 11 ms - number of pulses in each direction: 3 Bump test: - peak acceleration: 10 x g_n - pulse duration: 16 ms - number of pulses in each direction: 1000
Seismic test	IEC 60255-21-3	Test method B: biaxial multi-frequency random seismic test - 2 x g_n in horizontal direction - 1 x g_n in vertical direction

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