

Grid Automation Products

ITT600 Integrated Testing Tool

Release note

Version 2.1 HF1



Copyright

This document and parts thereof must not be reproduced or copied without written permission from Hitachi Energy, and the contents thereof must not be imparted to a third party, nor used for any unauthorized purpose.

The software or hardware described in this document is furnished under a license and may be used, copied, or disclosed only in accordance with the terms of such license.

Trademarks

Hitachi Energy is a registered trademark of Hitachi Energy Group. All other brand or product names mentioned in this document may be trademarks or registered trademarks of their respective holders.

Warranty

Please inquire about the terms of guarantee from your nearest Hitachi Energy representative.

Disclaimer

We reserve the right to make technical changes or modify the contents of this document without prior notice.

The data, examples and diagrams in this manual are included solely for the concept or product description and are not to be deemed as a statement of guarantee properties. All persons responsible for applying the equipment addressed in this manual must satisfy themselves that each intended application is suitable and acceptable, including that any applicable safety or other operational requirements are complied with. In particular, any risks in applications where a system failure and/or product failure would create a risk for harm to property or persons (including but not limited to personal injuries or death) shall be the sole responsibility of the person or entity, applying the equipment, and those so responsible are hereby requested to ensure that all measures are taken to exclude or mitigate such risks.

This document has been carefully checked by Hitachi Energy but deviations cannot be completely ruled out. In case any errors are detected, the reader is kindly requested to notify the manufacturer. Other than under explicit contractual commitments in no event shall Hitachi Energy be responsible or liable for any loss or damage resulting from the use of this manual or the application of the equipment.

Important notice

Experience has shown that reliable operation of our products is assured, providing the information and recommendations contained in these Operating Instructions are adhered to.

It is scarcely possible for the instructions to cover every eventuality that can occur when using technical devices and systems. We would therefore request the user to notify us directly or our agent of any unusual observations or instances, in which these instructions provide no or insufficient information.

In addition to these instructions, any applicable local regulations and safety procedures must always be strictly observed both when connecting up and commissioning this equipment.

We expressly accept no responsibility or liability for any damage, which may result from operation of this equipment, even if no reference is made to the particular situation in the Operating Instructions.

1. ITT600 version 2.1 HF1

Release Note

Dear Reader,

We are pleased to announce the release of ITT600 Version 2.1 HF1

Integrated Testing Tool ITT600 SA Explorer is designed for easy diagnosis and troubleshooting of IEC 61850-compliant substation automation systems and applications. The tool features convenient navigation, comprehensive presentation of application data and support for consistency checks, both on- and off-line.

ITT600 - Introduction

Integrated Testing Tool ITT600 SA Explorer is designed for easy diagnosis and troubleshooting of IEC 61850 compliant substation automation systems and applications. It features convenient navigation, comprehensive presentation of application data and support for consistency checks, both on and off-line.

ITT600 facilitates the easy exploration of the IEC 61850 configuration in any protection and control IED, the visualization of GOOSE messages and the communication simulation of an IED. ITT600's versatile functionality eliminates the need for multiple testing tools and helps engineers to isolate the root cause of system communication problems. This allows efficient diagnosis and troubleshooting of substation automation applications and therefore significantly reduces testing and commissioning time.

ITT600 SA Explorer makes IEC 61850 systems easy to use. By translating the complex terminology of communication protocols into the standardized IEC 61850 language, it makes the essential information available to all users, allowing anybody to use the same tool.

Ordering and delivery information

The ITT600 can be ordered from Grid Automation Products, Västerås, Sweden.

The delivery includes a case with the software, manual and installation guide on CD and the USB hardware license key.

ITT600 requires a USB hardware license key to function during start-up and runtime of the tool.

Life cycle statement

ITT600 SA Explorer Version 2.1 HF1 is a standalone product and replaces all former versions.

ITT600 SA Explorer Version 2.1 HF1 is available via internet download or with the built-in "check for updates" function.

ITT600 SA Explorer is a generic tool for testing, commissioning and maintenance of IEC 61850 based SA systems. Thus, it can be used together with any IEC 61850-compliant IEDs. However, it cannot be ensured that the full functionality of the tool can be supported for all such IEDs.

Documentation

Following documentation can be found on the product Memory Stick

- 1MRK512009-UEN-ITT600 installation guide
- 1MRK512006-UEN-ITT600 user manual
- 1MRG035473-ITT600 Release Note

Technical requirements on environment

The minimum hardware requirements are:

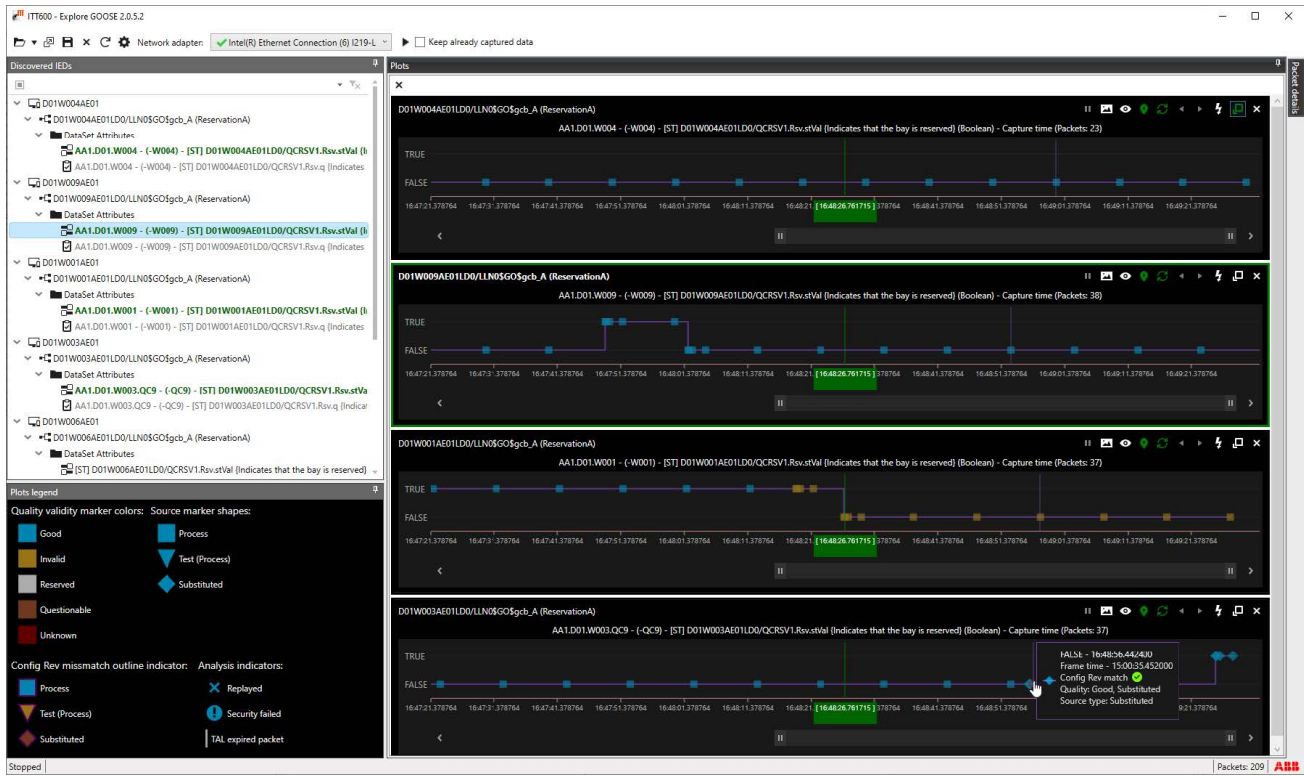
- 500 MB of free hard disk space
- Dual-core processor
- 3 GB RAM

The recommended hardware requirements for medium to big projects are:

- 1 GB of free hard disk space
- 64 bit operating system
- Quad-core processor
- 6 GB RAM
- SSD for system drive

The following operating systems are supported:

- Windows 10 (64-bit)
- Windows 11 (64-bit)
- Windows Server 2019



Installation

ITT600 2.1 HF1 will replace any previously installed version.

ITT600 requires additional components to run:

- Windows Installer 4.5
 - .NET Framework 4.8
 - Microsoft Visual C++ Redistributable 2022
- In case .NET Framework 4.8 and/or Microsoft Visual C++ Redistributable 2022 is missing, the setup will launch the

installer automatically. See more details in the *Installation Guide*.

Kind regards

Stefan Meier
Global Product Manager, Grid Automation Products

2. All releases and included changes since version 2.0

Hot Fix release ITT600 Version 2.1 HF1

(May 2022)

Licenses for versions < 2.1.0 will not work with this release

Changes and improvements

Updated NPcap to v1.60

Updated ISS stack to latest version (11.00.01.11)

General fixes and improvements

Installer do not proceed if newer version of VC++ redistributables already installed (#114498)

Cannot load SCD file when setSrcRef is of type VISSTRNG255 (#114793)

Connect to offline IED leads to crash (#114743)

Missing entries in IED Simulation tab (#113784)

ITT600 Version 2.1

(November 2021)

This release replaces the former ITT600 2.x versions and requires new license.

New and enhanced features

Main Window: New notifications (logs) panel

Main Window: Option to display timestamps with microseconds precision

Main Window: Unified time format in application

Explore SV: New user interface with user experience improvements

Explore SV: Dockable panels with layout saved on windows close

Explore SV: IEC 61869 support

Explore SV: Pcapng file format support

Explore SV: Multiple streams handling

Explore SV: Editable stream definition

Explore SV: Saving each stream to capture file

Explore SV: Parallel processing real and simulated streams

Explore IEDs: New add/edit IED/Server dialogs

Explore IEDs: Option to ignore Control Block states for commands

Simulation: Closing orphaned ISS window when simulating the same IED

Changes and improvements

New product installer

Full x64 support, product installed by default in 'Program files' folder

Distributed with and officially supported NPcap, WinPcap is no longer distributed

General fixes and improvements

Explore SV shows 60Hz instead of 50Hz in online mode (#87451)

Sample frequency does not appear in online mode (#88440)

Service pack release ITT600 Version 2.0 SP5

(April 2021)

This release replaces the former ITT600 2.0.x versions.

New and enhanced features

-
- Explore IEDs: MMS connection Keep Alive mechanism
 - Explore IEDs: RCB Reservation (IEC 61850 Edition 2.1)
 - Explore IEDs: Reading signed SCL files (IEC 61850 Edition 2.1)
 - Explore IEDs: Secure T-Profile: MMS over TLS connectivity to an IED
 - Explore GOOSE: Parallel processing of real and simulated packets
 - Explore GOOSE: Replay protection analysis (IEC 61850 Edition 2.1)
 - Explore Ethernet: ICMP packets decoding
 - Explore Ethernet: ARP packets decoding
 - Explore Ethernet: Additional information in details column if GOOSE packet is simulated
 - Explore Ethernet: GOOSE replay protection analysis (IEC 61850 Edition 2.1)
-

Changes and improvements

-
- Explore IEDs: New IED services view
 - Explore IEDs: Option to switch between flat and hierarchical LD view in navigation tree
 - Explore IEDs: Data flow view: additional VLAN filter
 - Explore IEDs: Quick Checker: nodes color matched with navigation tree
 - Explore IEDs: Quick Checker: additional filter by node status
 - Explore IEDs: Commands performed in ITT logged in Process Events
 - Explore IEDs: Local/UTC time displayed in Process Events, Security Events and Point to Point list according to main ITT option
 - Explore IEDs: Context menu in Data Attributes panel to refresh all attributes
 - Explore IEDs: Removed modality of command dialogs – multiple switches can be operated, and main window is not blocked
 - Explore IEDs: Keyboard shortcuts introduced for main operations (i.e. open tools, open (recent) file(s) etc.)
 - Explore GOOSE: New, improved packet details view (filtering, tooltips)
 - Explore GOOSE: New, improved IED tree
 - Explore GOOSE: Number of data points displayed on plot
 - Explore GOOSE: Data Attribute tool tip on plot with quality source type
 - Explore GOOSE: Keyboard shortcuts introduced for main operations
 - Explore Ethernet: New, improved packet details SA and stack view (filtering, tooltips)
 - Explore Ethernet: MMS PDU description displayed in separate panel in packet details SA view
 - Explore Ethernet: TCP and MMS segments assembly improvements
 - Explore Ethernet: Improved detection of IP protocols
 - Explore Ethernet: TCP packets details column improvements (additional information)
 - Explore Ethernet: Packets grid column chooser directly in grid (removed from main ITT option)
 - Explore Ethernet: Packets grid column layout saved in user settings
 - Explore Ethernet: Keyboard shortcuts introduced for main operations
 - Simulation: Enable/disable strict IEC 61850 Edition 2.1 RCB reservation
 - Simulation: Improved NIC configuration and additional logging information
-

General fixes and improvements

-
- Explore IEDs: Navigation tree nodes coloring and icons not correct (#93586)
 - Explore IEDs: INT64 not supported in Data Attributes panel (#93568)
 - Explore IEDs: Cannot Manually enable BRCB (#90295)
 - Explore Ethernet: Crash when selecting MMS packet with loaded model (#90398)
 - Explore Ethernet: GOOSE dataset with FCD (FC=ST) is not decoded properly (#90298)
 - Explore Ethernet: In online capture MMS details not displayed (#93104)
 - Explore Ethernet: Wrong MAC capture filter when opened from navigation tree (#90294)
 - Explore Models: Differences when comparing model from loaded in ITT with the same model loaded in compare window (#92925)
 - Explore GOOSE: Capture stop when decoding packet with null value TLV (#90754)
 - Explore GOOSE: Cannot pause plot when sync is enabled (#92327)
 - Explore GOOSE: Quality of Data Attribute not correctly displayed on plot (#94923)
-

Service pack release ITT600 Version 2.0 SP4

(October 2020)

New and enhanced features

-
- Main window: Dockable panels of main window with layout saved after close
 - Main window: Model trees searching, navigation, grouping, access to details
 - Main window: Refreshed log panel and renamed to "Notifications"
 - Main window: Refreshed "Get started" tab
 - Explore IEDs: Removed elevation from main application – still required in case of simulation of IED when IP configuration on NIC has to be changed
 - Explore IEDs: Updated IEC 61850 library and stack to latest version
 - Explore GOOSE: New UI, improved UX
 - Explore GOOSE: New plots
 - Explore GOOSE: Dockable panels with layout saved on window close
 - Explore GOOSE: RGOOSE support
 - Explore GOOSE: pcapng file format support
 - Explore GOOSE: Simultaneous usage with Explore SV and Explore Ethernet
 - Explore Ethernet: New UI, improved UX
 - Explore Ethernet: Dockable panels with layout saved on window close
 - Explore Ethernet: New packets stack view
 - Explore Ethernet: RGOOSE support
 - Explore Ethernet: RSV support
 - Explore Ethernet: IEC 61869 support
 - Explore Ethernet: PTPv2 support
 - Explore Ethernet: pcapng file format support
 - Explore Ethernet: Simultaneous usage with Explore SV and Explore GOOSE
 - Explore SV: Simultaneous usage with Explore Ethernet and Explore GOOSE
-

General fixes and improvements

-
- Explore IEDs: Cannot operate CSWI if is not configured with real switch (missing configuration in Subnetwork section) (#55162, #57698)
 - Explore IEDs: NIC details shows only one IP (#45989)
 - Explore IEDs: Quick checker crashes and/or showing wrong data (#55226)
 - Explore Ethernet: PTPv2 support (#43199)
 - Explore Ethernet: Saving last split file in online capture after stop (#43321)
 - Explore Models: FCDA Array support (#47011)
 - Explore GOOSE: Capture in Explore GOOSE stops if the IED is restarted (#45683)
-

Service pack release ITT600 Version 2.0 SP3 (August 2019)

New and enhanced features

-
- Responsive UI during long running operations: Starting simulation & Connecting to IED
 - Additional log message indicating that gateway cannot be simulated
 - Updated/Revised context menus
 - Context menu for customer names switch on the tree view
 - IED connection view on subnetwork (#21903)
 - Improved log panel performance in verbose mode logging
 - Enabling/Disabling SV Control Blocks
-

General fixes and improvements

-
- Explore IEDs: Support for multiple LPHDS
 - Explore IEDs: Support MMS array data types to be simulate (#24698)
 - Explore IEDs: Improved Dynamic Data Set functionality
 - Explore IEDs: Mismatch of switch position between IEC 61850 stack and User Interface (#31129)
 - Explore IEDs: Exception when connecting to an IED in DO view (#31318)
 - Explore IEDs: Values not updated after connecting to an IED (#34385)
 - Explore IEDs: Crash after MMS Client Timeout change (#40682)
 - Explore IEDs: Confirm Edit SG Values not possible (#40684, #40691)
 - Explore IEDs: RCB properties write error during a negative response from Server (#40686, #40688)
 - Explore IEDs: Owner class for RCB missing (#26112)
 - Explore IEDs: No warning/error message when Subnetwork type in the SCD is not set or not part of 8-MMS (#33037, #39168)
 - Explore IEDs: ITT does not create the Topology while browsing IED without SCD file if there are LD under LD (#38252)
 - Explore IEDs: IED misconfigured after reconnecting (#37388,)
 - Explore IEDs: IEC edition not recognized (#38134)
 - Explore IEDs: No communication with an IED/problem simulating (#39247)
 - Explore Models: Export to excel model differences
 - Explore Models: Improved UX
 - Explore Ethernet: Decoding SV packets with HSR frame and/or with Vlan frame
 - Explore Ethernet: Cannot decode SV Packets (wrong TLV detection) (#40689)
-

Explore Ethernet: Sampled Values with HSR frame are not recognized (#38016, #40679)

Explore Ethernet: Exception decoding MMS packet (#34673)

Explore Ethernet: Capture network traffic from context menu always crash first time (#40683)

Explore Ethernet: Wrong representation of Report Times in MMS report (#40687)

Explore Ethernet: Bad timestamp quality: Leap second known (#33569)

Explore Models: In case a node is missing in one model, there are no differences (#32342)

Explore GOOSE: GOOSE signals not received (#35981)

Explore GOOSE: GOOSE signals not updated when changed by another IED (#40478)

Explore SV: SV streams with the same SV ID distinguished by Simulation bit

Explore SV: SV streams with the same SV ID distinguished by HSR lane tag

Explore SV: Improved SV stream statistics (#37155)

Explore SV: Changed Invalid/reserved quality settings according to 9-2 (#35116)

Explore SV: 16.7Hz Support (#31392)

Explore SV: Cannot decode SV Packets (wrong TLV detection) (#40689)

Explore SV: Inconsistent behavior of SV reference (#40680)

Explore SV: Cannot show simulated and real stream (#38018)

Explore SV: Sampled Values with HSR frame are not recognized (#38016, #40679)

Explore SV: Phases of unused signals are fluctuating in simulation mode (#35836)

Explore SV: ConfRev and APPID are not shown (#32780)

Explore SV: Phasors Displayer keeps displaying phasors after unplug network cable (#12172)

Service pack release ITT600 Version 2.0 SP2

(April 2016)

New and enhanced features

New IED Status View showing the complete IED status in respect to its testing configuration

Representation of LD naming (Flexible Product Naming)

The user is informed before disconnecting an IED in case there are active Blockings, Substitution or Testing.

Quick Checker reads and compares more attributes

IEDs containing a ServerAt SCL element can be simulated

General fixes and improvements

Improvements in the Setting Group Editor (Available on the Setting Group Control Block)

Explore Models robustness is improved

Improved performance when browsing IEDs

Connect all IEDs allows now to additionally enable all reports. The operation can also be cancelled

Connect all IEDs shows only one message box at the end of the operation

The default OrIdent for control commands can be set in the ITT600 options

Explore GOOSE shows DataSet name in addition to the GOOSE control block name

Synchronized destination folder for MMS and FTP file transfer

Synchronized description in Process Event and Point Value List

Process Event List shows Functional Constraint SP changes

Description (Customer Names) of IEDs and other nodes can be shown in the tree view (new tool option)

PRP Supervision Frames Analyzer shows additional information

The detected IEC 61850 Edition is shown in IED properties

IEC 61850 CDC type is shown in Data properties

SCL Text Elements are shown in the properties

Removed duplicated entries in IED Simulation tab

Improved coloring in Explore SV

Client IEDs is shown for GOOSE control blocks

Installed .Net 4.6 is detected and does no longer cause a startup crash.

Time handling and therefore visualization in Explore GOOSE is improved

Quality attributes invalid and reserved are now displayed correctly in Explore SV

Service pack release ITT600 Version 2.0 SP1

(January 2015)

General fixes and improvements

When simulating an IED, its IP address is now added to the selected Network Interface Card (NIC). The existing IP Address is not changed anymore. In previous version, the whole IP address settings of the NIC were changed.

The selected NIC for IED simulation is shown in the status bar of ITT600 Explore IEDs.

All attributes are now initialized with a default value after the simulation has been started. All CSWI/XCBR Logical Nodes (LN) are simulated as "Open", CILO LN Open / Close interlocked is set to "false" and the command authority is set to "Station".

When simulating an Ed.1 IEDs, missing trigger options are added for all required attributes. In previous versions the trigger options were only added for Attributes with references to a Dataset located in LLN0

Improved MMS file transfer service support for simulated IEDs.

IEDs with more than 500 GOOSE inputs can be simulated.

The progress bar when starting the IED simulation now disappears when the simulation is ready.

The status of Logical Nodes (connected, simulated, offline) is now synchronized between the "By Subnetworks" and "By Substation" tree views.

The corresponding Dataset name is shown next to the Report Control Block name in the treeview

Unique Report ID (RptID) is set when enabling a buffered or unbuffered Report and therefore also the Client column of the Eventlist is filled.

Commands for VSGGIO (DPStatus) are now supported.

Disable all substituted values works now also for nested elements.

All ReportControlBlock option fields can be written to an IED before enabling a Report.

VLAN ID and GOOSE APPID are displayed in hexadecimal format in ITT600 Explore Ethernet.

Comparison filters in ITT600 Explore Models have been fixed.

ITT600 SA Explorer is now installed properly for all users of the computer.

ITT600 Version 2.0

(March 2014)

New and enhanced features

Support for IEC 61850 Ed.2

Simulation of an IED for IEC 61850-8-1 based communication services (MMS and GOOSE)

Comparison of network equipment device configuration parameters is included in the "Quick Checker"

Support for larger SCL files since ITT600 SA Explorer is running as native 64 bit process

Support for Windows 8 (32 Bit / 64 Bit)

General fixes and improvements

Startup page for easy access of recently used files and IEDs

Unified options dialog for all ITT600 configuration options

Function to directly open the device web interface in a web browser

MMS file transfer folder is always shown

Select Before Operate command dialog shows Local/Remote and Interlocking status

Functional naming and description included in Explore GOOSE module

Direct access to GOOSE Packet details in Explore GOOSE module

Performance in Explore Models module improved

Hitachi Energy Sweden AB
Grid Automation Products
SE-721 59 Västerås
Phone +46 (0) 10 738 00 00
E-Mail: contact-us@hitachienergy.com

<https://hitachienergy.com/substation-automation>



Scan this QR code to visit our website