COM600 Station Automation Series
COM610 3.2

Operator's Guide

Contents:

1. About this manual

1.1. Copyrights

The information in this document is subject to change without notice and should not be construed as a commitment by ABB Oy. ABB Oy assumes no responsibility for any errors that may appear in this document.

In no event shall ABB Oy be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB Oy be liable for incidental or consequential damages arising from use of any software or hardware described in this document.

This document and parts thereof must not be reproduced or copied without written permission from ABB Oy, 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.

© Copyright 2006 ABB. All rights reserved.

1.2. Trademarks

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

1.3. General

This manual provides thorough information on the Communication Gateway COM610 and the central concepts related to it. For more information on each topic related to a specific protocol, refer to the list of related documents in 1.8, Related documents.

Information in this operator's guide is intended for operators who perform every-day operations.

1.4. Document conventions

The following conventions are used for the presentation of material:
- The words in names of screen elements (for example, the title in the title bar of a window, the label for a field of a dialog box) are initially capitalized.

- Capital letters are used for the name of a keyboard key if it is labeled on the keyboard. For example, press the ENTER key.
- Lowercase letters are used for the name of a keyboard key that is not labeled on the keyboard. For example, the space bar, comma key, and so on.
- Press CTRL+C indicates that you must hold down the CTRL key while pressing the C key (to copy a selected object in this case).
- Press ESC E C indicates that you press and release each key in sequence (to copy a selected object in this case).
- The names of push and toggle buttons are boldfaced. For example, click **OK**.
- The names of menus and menu items are boldfaced. For example, the **File** menu.
  - The following convention is used for menu operations: **MenuName > MenuItem > CascadedMenuItem**. For example: select **File > New > Type**.
  - The **Start** menu name always refers to the **Start** menu on the Windows taskbar.
- System prompts/messages and user responses/input are shown in the Courier font. For example, if you enter a value out of range, the following message is displayed:

```
Entered value is not valid. The value must be 0 to 30.
```

- You may be told to enter the string MIF349 in a field. The string is shown as follows in the procedure:

  MIF349
- Variables are shown using lowercase letters:

  sequence name

1.5.   Use of symbols

This publication includes warning, caution, and information icons that point out safety related conditions or other important information. It also includes tip icons to point out useful information to the reader. The corresponding icons should be interpreted as follows.

The electrical warning icon indicates the presence of a hazard which could result in electrical shock.

The warning icon indicates the presence of a hazard which could result in personal injury.

The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.

The information icon alerts the reader to relevant facts and conditions.

The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

1.6. Terminology

The following is a list of terms associated with the Communication Gateway COM610 that you should be familiar with. The list contains terms that are unique to ABB or have a usage or definition that is different from standard industry usage.

Term	Description
Alarm	An abnormal state of a condition.
Alarms and Events; AE	An OPC service for providing information about alarms and events to OPC clients.
Data Object; DO	Part of a logical node object representing specific information, e.g., status or measurement. From an object-oriented point of view a data object is an instance of a class data object. DOs are normally used as transaction objects; i.e., they are data structures.
Device	A physical device that behaves as its own communication node in the network, e.g. protection relay.
Event	Change of process data or an OPC internal value. Normally, an event consists of value, quality and timestamp.
Intelligent Electronic Device	A physical IEC 61850 device that behaves as its own communication node in the IEC 61850 protocol.
LON	A communication protocol developed by Echelon.
LON Application Guideline for substation automation; LAG	A proprietary method of ABB on top of the standard LON protocol.
OPC	Series of standards specifications aiming at open connectivity in industrial automation and the enterprise systems that support industry.
Property	Named data item.
SPA	ABB proprietary communication protocol used in substation automation.

1.7.   Abbreviations

The following is a list of abbreviations associated with the Communication Gateway COM610 that you should be familiar with. See also 1.6, Terminology.

Abbreviation	Description
AE	Alarms and Events
CET	Communication Engineering Tool
DO	Data Object
GW	Gateway, component connecting two communication networks together
HMI	Human Machine Interface
IEC	International Electrotechnical Commission
IED	Intelligent Electronic Device
LAG	LON Application Guideline for substation automation
LAN	Local Area Network
NCC	Network Control Center
SLD	Single Line Diagram

1.8.   Related documents

Name of the manual	MRS number
COM600 User's Guide	1MRS756125
DNP LAN/WAN Master (OPC)	1MRS756566
DNP Serial Master (OPC)	1MRS756567
DNP LAN/WAN Slave (OPC)	1MRS755496
DNP Serial Slave (OPC)	1MRS755495
External OPC Client Access	1MRS755564
IEC 60870-5-101 Slave (OPC)	1MRS755382
IEC 60870-5-103 Master (OPC)	1MRS752278
IEC 60870-5-104 Slave (OPC)	1MRS755384
IEC 61850 Master (OPC)	1MRS755321
LON-LAG Master (OPC)	1MRS755284
Modbus Serial Master (OPC)	1MRS756126
Modbus TCP Master (OPC)	1MRS756445
SPA Master (OPC)	1MRS752275
SPA Router (OPC)	1MRS755497

1.9. Document revisions

Document version/date	Product revision	History
A/16.10.2006	3.0	Document created
B/21.12.2007	3.1	Document revised
C/17.06.2008	3.2	Document revised

2. Introduction

2.1. Product overview

Communication Gateway COM610 acts as an embedded communication gateway between substation automation protection and control devices and Network Control Centers (NCC).

COM610 uses an embedded operating system and runs in a dedicated industrial computer without moving parts.

The products are configured using a separate engineering PC that is connected via the local area network (LAN). For more information, refer to COM600 User's Guide.

Gateway Functionality

The gateway functionality provides a framework that enables the use of OPC server and client components, such as OPC Client for IEC 60870-5-101 and OPC Server for LON LAG 1.4. For more information, refer to COM600 User's Guide.

3. Operation of the COM610

3.1. Opening a project in CET

To open a project in CET:

1. Select **File > Open/Manage Project...**.
2. In the Open/Manage Project dialog, select the required location for the project:
   - Projects on my computer
   - Projects on network
3. Expand the projects list, by clicking on the + symbol, to select the required project.
4. Click **Open Project**

3.2. Gateway management

The Gateway Management tool enables you to transfer the configurations of the objects to the COM600 computer.

To be able to use the Gateway Management Tool, the engineering computer must be connected to the COM600 computer. The IP address of the used ethernet port in the COM600 computer must be entered to the corresponding Gateway object property. For more information, see COM600 User's guide.

To open the Gateway Management tool, right-click the Gateway object in Communication Engineering Tool (CET) and select **Management**.

- To copy the configurations of all servers and clients to the Gateway computer, click **Update configuration**.
- To restart all servers and clients with the latest configurations, click **Reload configuration**.
- To transfer only the changed configurations and to restart only the changed server or client with new configurations, click **Update & reload configuration**.

3.3. License handling

The Gateway Management tool displays the license information for COM600 under License Information. The license and the protocols it supports have been predefined before the COM600 computer has been handed over by ABB.

The following information is shown in the window:
- owner of the license
- product revision
- protocols supported by the license.
- number of servers supported by the license.

- number of clients supported by the license.
- if WebHMI is enabled.

To update the license with a new set of protocols, order a new license from ABB and update it to COM600 with Communication Engineering Tool.

To update the license:
1. Open the Gateway Management tool.
2. Click **Update License**.
3. Browse for the new license file and click **Open**.

The license is COM600 specific and the COM600 computer verifies the compatibility of the license. Also the servers and clients verify the license.

4. Diagnostics

4.1. General about diagnostics

Communication Engineering Tool (CET) provides comprehensive functions for diagnosing the operation of the Gateway. This includes communication diagnostics with monitoring the communication channel, diagnostic counters and IED specific communication status and diagnostic counters. It is also possible to monitor and control process data and follow the data flow on the Gateway using diagnostic functions of CET. Figure 4.1-1 displays a sample view of a diagnostic counter dialog. An example of an event log file is displayed in Figure 4.1-2
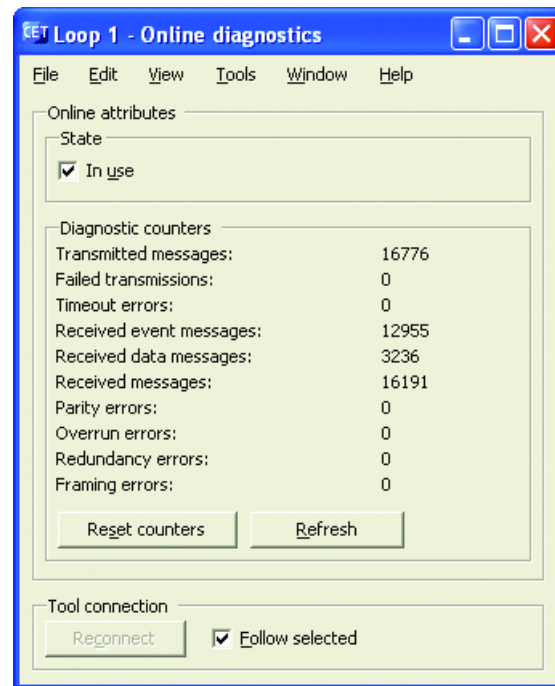
SPAChnlDiag.jpg

Figure 4.1-1 An example of a SPA channel diagnostic counter dialog

Operator's Guide

EventDial.jpg
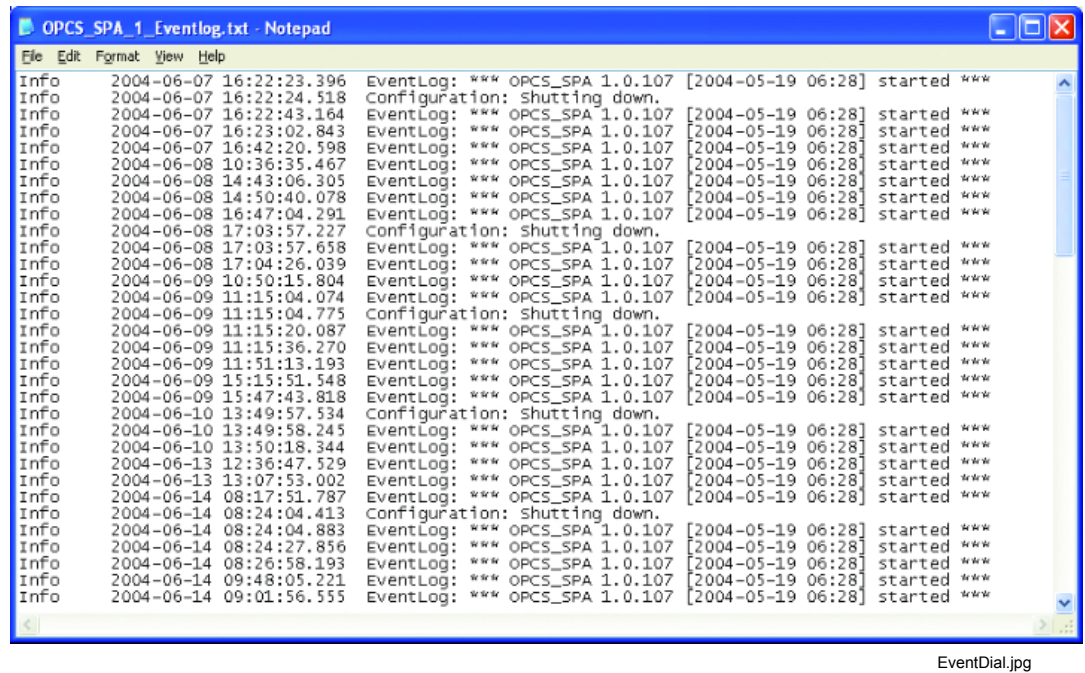
Figure 4.1-2 An example of a SPA event log file

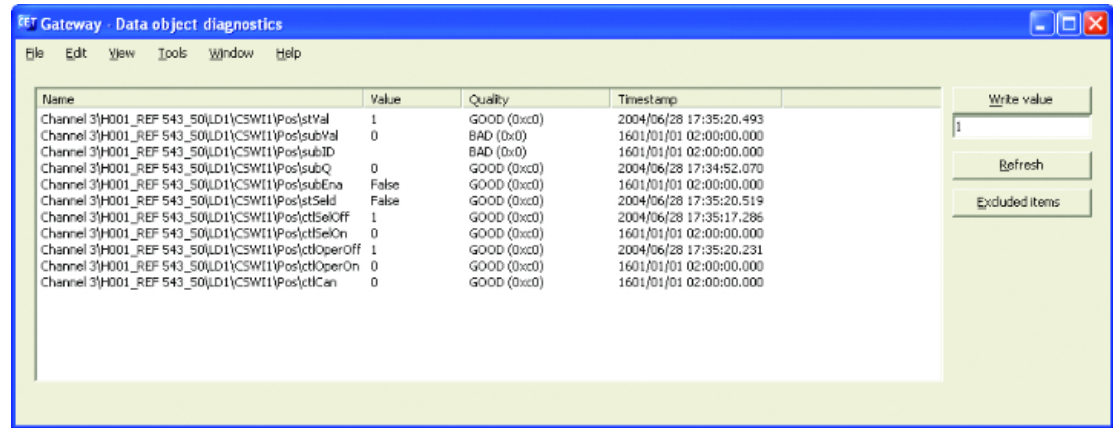## 4.2. Data object diagnostics

You can monitor and control the data objects under the Gateway's object tree with Data object diagnostics.

To monitor and control the data objects:
1. Right-click the Gateway.
2. Select **Data object diagnostics** from the shortcut menu, see Figure 4.2-1. The Data object diagnostic dialog opens.
3. Drag and drop data objects from the object tree to the Data object diagnostics.

or

1. Select a specific data object from the object tree.
2. Select **Tools > Online diagnostics**.

Figure 4.2-1 Data object diagnostics

To change the value of a data object attribute:
1. Select a specific attribute.
2. Write a new value to the text box under the **Write value** button.
3. Click **Write value** to change the value.

To filter the displayed data object:
1. Click **Excluded items**.
2. Notepad opens. Write to Notepad the data object types you want to exclude from the Data object diagnostics view.
3. Save the Notepad file by selecting **File > Save**.

4.3. Diagnostic services of OPC servers and clients

You can control and monitor the server and client channel and device communication in the communication structure of the Project Explorer. You can take channels/subnetworks and devices into use or out of use via the respective diagnostics function. You can also monitor the channel/subnetwork and device communication with the help of various diagnostic counters, and check the device status information, see Figure 4.3-1.
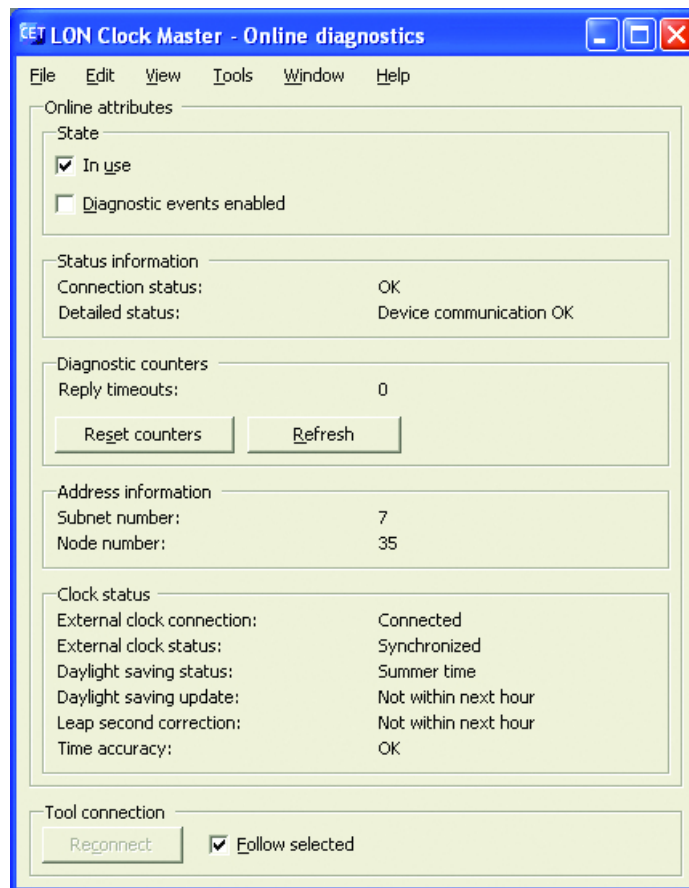
LONClockMaster.jpg

Figure 4.3-1 An example of LON Clock Master online diagnostics

For more detailed information and instructions on controlling and monitoring channel and device communication, refer to the respective user's guide for the client or server (see 1.8, Related documents).

4.4. Signal diagnostics

OPC clients have a diagnostic function which makes it possible to monitor the flow of process data changes and commands. Activate the function by marking the Diagnostic Events Enabled check box, located in the Online diagnostics function of the IEC101/IEC104 Device. When the diagnostic function is activated, the IEC101 OPC Client Alarm & Event server generates events with information about data changes and commands.

IEC101AEClient.jpg

Figure 4.4-1 IEC101 Slave OPC Client Diagnostic AE client

4.5. Diagnostic Web Server

The Diagnostic Web Server of the Gateway provides an overall view of the communication status of the Gateway and the possibility to monitor the diagnostic counters of the communication channels/subnetworks and IED communication. Figure 4.5-1 displays the gateway objects in a tree view.

A red cross over the Gateway icon in the object tree indicates that there is a fault in the communication structure. Expand the tree to view the hierarchy deeper and to identify the device with a missing configuration or causing the error. The properties of a certain object in the communication structure can be seen on the right when clicking on the object in the tree view.

Webserver_a.jpg

Figure 4.5-1 An example of a web page from the Gateway diagnostic web server

Index

C

D

G

U