# Grid Automation Controller COM600 4.0
# MNS iS Connectivity (OPC) User's Manual

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**ABB**

**Contents:**

# 1. About this manual

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## 1.2. Trademarks

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## 1.3. General

This manual provides thorough information on the MNSis OPC Server and the central concepts related to it. You find instructions on how to configure the MNSis OPC Server related objects. The basic operation procedures are also discussed.

Information in this user's manual is intended for application engineers who configure the MNSis OPC Server.

This user's manual is divided into following sections:

### Introduction

This section gives an overview of the MNSis OPC Server and its features.

**Configuration**

In this section you will find an overview of configuration. You are given instructions on how to configure MNSis OPC Server related objects and the model of a substation or system.

## 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 - 30  .`

- You can be asked 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 may 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

| 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 Access; DA | An OPC service for providing information about process data to OPC clients. |
| Data Object; DO | Part of a logical node object representing specific information, for example, 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; that is, they are data structures. |
| Data Set | The data set is the content basis for reporting and logging. The data set contains references to the data and data attribute values. |
| Device | A physical device that behaves as its own communication node in the network, for example, protection relay. |
| Event | Change of process data or an OPC internal value. Normally, an event consists of value, quality, and timestamp. |

| Term | Description |
|---|---|
| Intelligent Electronic Device | A physical IEC 61850 device that behaves as its own communication node in the IEC 61850 protocol. |
| Logical Device; LD | Representation of a group of functions. Each function is defined as a logical node. A physical device consists of one or several LDs. |
| Logical Node; LN | The smallest part of a function that exchanges data. An LN is an object defined by its data and methods. |
| 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. |
| OPC item | Representation of a connection to the data source within the OPC server. An OPC item is identified by a string <object path>:<property name>. Associated with each OPC item are Value, Quality, and Time Stamp. |
| Property | Named data item. |
| Report Control Block | The report control block controls the reporting processes for event data as they occur. The reporting process continues as long as the communication is available. |
| SPA | ABB proprietary communication protocol used in substation automation. |
| SPA device | Protection and/or Control Product supporting the SPA protocol version 2.5 or earlier. |
| Substation Configuration Language; SCL | XML-based description language for configurations of electrical substation IEDs. Defined in IEC 61850 standard. |

# 1.7.    Abbreviations

| Abbreviation | Description |
|---|---|
| AE | Alarms and Events |
| ASDU | Application Service Data Unit |
| BRCB | Buffered Report Control Block |
| DA | Data Access |
| DMCD | Data Message Code Definition |
| DO | Data Object |
| GW | Gateway, component connecting two communication networks together |
| HMI | Human Machine Interface |

| Abbreviation | Description |
|---|---|
| IEC | International Electrotechnical Commission |
| IED | Intelligent Electronic Device |
| LAG | LON Application Guideline for substation automation |
| LAN | Local Area Network |
| LD | Logical Device |
| LMK | LonMark interoperable device communicating in LonWorks network. In this document, the term is used for devices that do not support the ABB LON/LAG communication. |
| LN | Logical Node |
| LSG | LON SPA Gateway |
| NCC | Network Control Center |
| NUC | Norwegian User Convention |
| NV | Network Variable |
| OLE | Object Linking and Embedding |
| OPC | OLE for Process Control |
| P&C | Protection & Control |
| PLC | Programmable Logic Controller |
| POU | Program Organization Unit |
| RTS | Request To Send |
| SA | Substation Automation |
| SCD | Substation Configuration Description |
| SCL | Substation Configuration Language |
| SFC | Sequential Function Chart |
| SLD | Single Line Diagram |
| SNMP | Simple Network Management Protocol |
| SNTP | Simple Network Time Protocol |
| SOAP | Simple Object Access Protocol |
| RCB | Report Control Block |
| URCB | Unbuffered Report Control Block |
| XML | eXtended Markup Language |

## 1.8.          Related documents

| Name of the manual | MRS number |
|---|---|
| COM600 User's Manual | 1MRS756125 |

## 1.9.          Document revisions

| Document version/date | Product revision | History |
|---|---|---|
| A/17.6.2008 | 3.2 | Document created |
| B/13.2.2009 | 3.3 | Document revised |
| C/06.11.2009 | 3.4 | Document revised |
| D/30.6.2011 | 3.5 | Document revised |
| E/31.5.2012 | 4.0 | Document revised |

# 2. Introduction

## 2.1. Functional overview

MNS *i*S OPC server is used for the communication to the MLink devices. COM600 and MLink devices are physically connected together using the LAN connections. MNS *i*S OPC server is connected to the COM600 software using an MNS *i*S connectivity server. MNS *i*S connectivity server remodels and links the data from the MNS *i*S OPC server to the IEC 61850 data model used by the COM600 applications. OPC DA is used between the MNS *i*S OPC Server and the connectivity server.
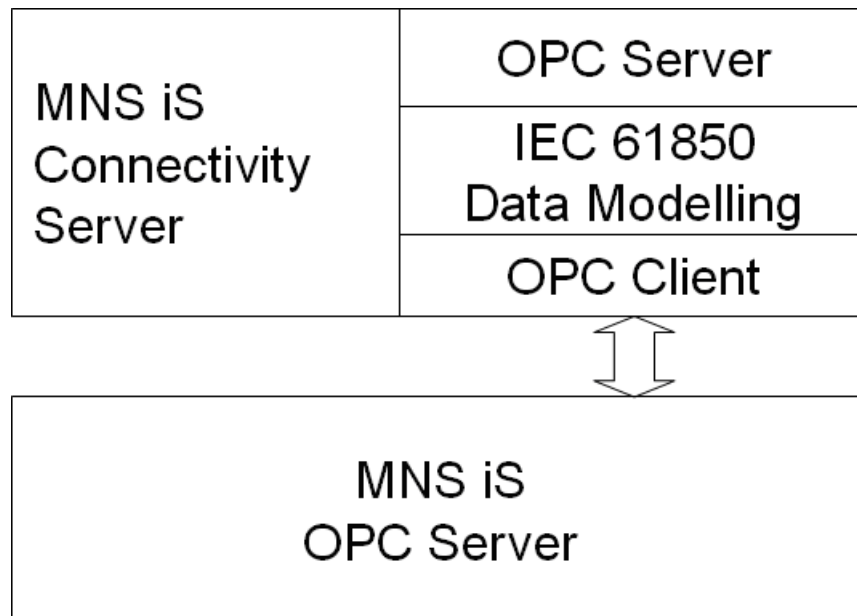


*Figure 2.1-1 MNS iS connectivity server overview*

## 2.2. IEC 61850 data modeling

IEC 61850 data modeling is described in further detail in section *IEC 61850 data modeling* of COM600 User's Manual.

## 2.3. Features

The MNS *i*S connectivity server supports the following features:

- OPC Data Access Server v. 1.0/2.0
- OPC Alarms and Events Server v. 1.10

- OPC Data Access Client v.2.0
- IEC 61850 data modeling

The following data can be used from MNS *i*S OPC DA Server in COM600:

- Measurement values
- Trip and alarm indications
- Device Status indications
- Communication status indications

Timestamps for data changes in the MNS *i*S OPC DA OPC server are not transferred from IEDs. They are created by the OPC server based on the computer system time.

The recommended maximum number of MControl devices that can be connected to one COM600 is 180.

# 3.           Configuration

## 3.1.           About this section

This section describes the installation and configuration of the MNS *i*S OPC server.

## 3.2.           Overview of configuration

To commission COM600 MNS *i*S, install the MNS *i*S OPC Server to the COM600 computer. The COM600 MNS *i*S Connectivity Server configured using Station Automation Builder 600 (later referred to as SAB600).

The configuration of the MNS *i*S OPC Server prepares COM600 to communicate with the MNS *i*S devices and retrieving the data to the OPC server namespace. The connectivity server configuration links the data from the MNS *i*S OPC Server to COM600 framework, to be used with other COM600 functions like the HMI and gateway.

## 3.3.           MNS *i*S OPC Server installation and configuration

### Installing MNS *i*S OPC Server

To install the MNS *i*S OPC Server, run the executable file C:\MNSiS\setup.exe.

### DCOM Configuration

When configuring the MNS *i*S OPC server, run under COM600 user account

To modify the DCOM configuration:
1.   Select **Start > Control Panel > Administrative Tools > Component Services > Component Services > Computers > My Computer > DCOM Config**.
2.   Right-click **ABB MNS iS OPC DA Server** and select **Properties**.
3.   In the **Identity** tab, select **This user**.
4.   Enter COM600 to the User field and the correct password to the password fields.
5.   Click **Apply** to accept the changes.

If the password of the COM600 user is changed later, for example, with the SAB600 management tool, the password must be manually changed for the MNS iS OPC server as described above.

### Namespace Configuration

MNS *i*S OPC server software package has a service which scans the network for MLink devices. When MLink devices are found, they are added to the OPC server namespace. If a previously found device does not respond, it is removed from the namespace. If the COM600 configuration includes OPC items that are not found in the namespace, the namespace is cyclically scanned for any changes. Missing items will be used, if they are found during the cyclic scan.

## 3.4.     MNS *i*S OPC Connectivity Server Configuration using SAB600

### Building Object Tree

Building the object tree in the communication view of SAB600 is described in section *Building object structures* of COM600 User's Manual.

In the communication structure, the subnetwork object is used to group the MControl devices which are connected to separate MLink devices. If the communication status of the MLink is needed as an own signal, an own IED for the Mlink must be created as well. Below this IED an LD and LLN0 with Health mapped to the communication status must be created. MControl devices are presented as IEDs in the tree. The data from the MControls is modeled as data objects below logical nodes and logical devices. The LLN0 Health must be mapped to the communication status OPC item of the MNS iS OPC Server.
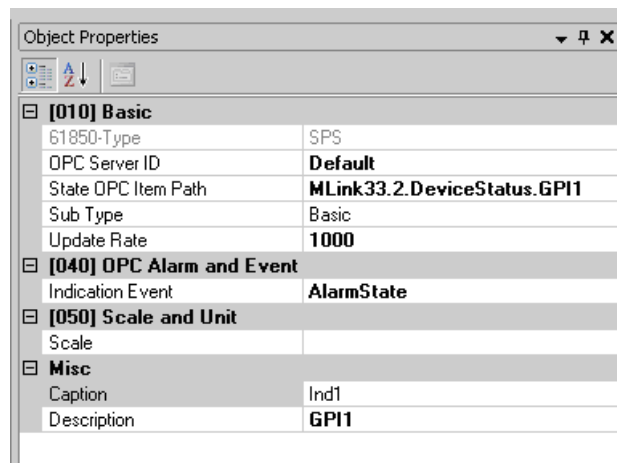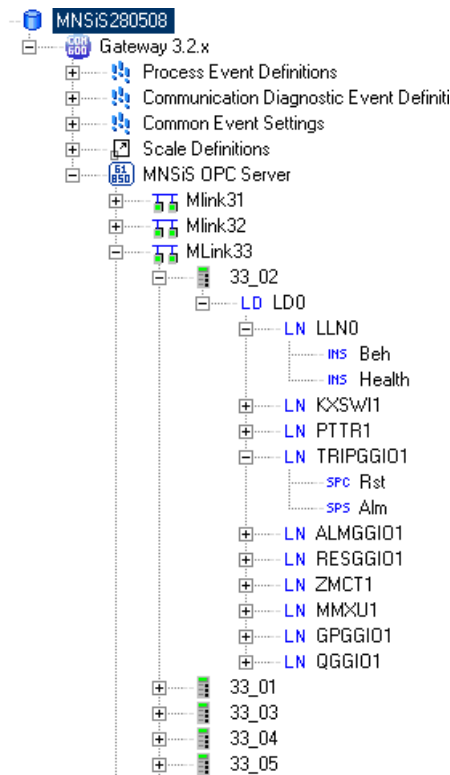
MNSiS_object_tree.png

*Figure 3.4-1 MNS iS OPC server object tree example*

## 3.5. Configuring objects

Server and subnetwork object do not normally need any change to the default values of
the properties. On the IED object, the event definition for the device connection status
is configured according to the needs of the project.

Data objects contain the OPC item paths to the MNS *i*S OPC server. This specifies the
source data used to update the values of the data object. Below is an example of **SPS
data** which gets its value from the **MLink33.2.DeviceStatus.GPI1** OPC item from the
MNS *i*S OPC Server.

- Update Rate property specifies the maximum rate the OPC server updates the item.
- The shortest rate supported by the MNS iS OPC Server is 1000 ms.

MNSiS_object_properties.png

*Figure 3.5-1 An example of MNSiS object properties*

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