NT-Converter

Interface module for IG/IS-NT Gen-set controllers

SW version 1.5.0

Global Guide

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1 Document information

1.1 Clarification of Notation

Note: *This type of paragraph calls the reader's attention to a notice or related theme.*

> **IMPORTANT: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.**

> **WARNING: This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.**

> **Example:** This type of paragraph contains information that is used to illustrate how a specific function works.

1.2 About this guide

NT-Converter is an interface module for IG/IS-NT controllers. It allows to connect them into an existing system consisting of IG/IS classic line controllers or to some third-party Gen-set controllers (Woodward, Barber-Colman, ...) via their analog Load Sharing lines. Connection via their CAN2 bus is available from the 1.1 version of NT-Converter.

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General security recommendations and set of measures

1. AccessCode

• Change the AccessCode BEFORE the device is connected to a network.

• Use a secure AccessCode – ideally a random string of 8 characters containing lowercase, uppercase letters and digits.

• For each device use a different AccessCode.

2. Password

• Change the password BEFORE the device enters a regular operation.

• Do not leave displays or PC tools unattended if an user, especially administrator, is logged in.

3. Controller Web interface

• The controller web interface at port TCP/80 is based on http, not https, and thus it is intended to be used only in closed private network infrastructures.

• Avoid exposing the port TCP/80 to the public Internet.

4. MODBUS/TCP

• The MODBUS/TCP protocol (port TCP/502) is an instrumentation protocol designed to exchange data between locally connected devices like sensors, I/O modules, controllers etc. From it's nature it does not contain any kind of security – neither encryption nor authentication. Thus it is intended to be used only in closed private network infrastructures.

• Avoid exposing the port TCP/502 to the public Internet.

5. SNMP

- The SNMP protocol (port UDP/161) version 1,2 is not encrypted. Thus it is intended to be used only in closed private network infrastructures.
- Avoid exposing the port UDP/161 to the public Internet.

1.4 Document history

Revision number	Related sw. version	Date	Author
7	1.5.0	6.3.2023	Petr Chvojka
6	1.4.0	1.4.2019	Roman Taragel
5	1.4.0	16.4.2013	Roman Taragel
4	1.3.0	3.1.2013	Roman Taragel
3	1.2.0	11.5.2011	Roman Taragel
2	1.1.0	11.8.2010	Roman Taragel
1	1.0.0	12.6.2006	Roman Taragel

2 System overview

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2.1 Supported controllers

NT-Converter can be used only with:

> IG-CU ver. 5.6, ver.6.0 and higher

> IS-CU ver. 2.7 and higher

> IM-CU ver. 5.1 and higher

> IG-NT ver. 1.0 and higher

> IS-NT ver. 1.0 and higher

> IG 200/500/1000 (any generation)

> **IMPORTANT: IM-NT is NOT supported!**

2.2 Functions

The module allows connect one IG/IS-NT controller into an existing system consisting of several IG-CU and/or IS-CU controllers (classic line, most likely MINT application). It also allows connect one IG/IS-NT controller into a system consisting of third-party controllers with Load **Sharing** capability. The VAr sharing is supported only with Cummins PCC controllers. The connection via CAN bus allows to use Var Sharing and synchronized parameters (for case, when Setpoint: **#Pwr mgmt mode** --> ABS (kW) only). The synchronization is available only for setpoints that were implemented in standard IG-CU. Connected Controllers are in the same logical group. The module allows controller monitoring via IG-MU, IG-IB or I-LB / I-LB+. These modules have to be connected on CAN bus on IG/IS-CU side.

> **IMPORTANT: The module does NOT allow to connect IM-NT controller into an other system!**

Note: Due to different implementation of relative power management in IG/IS-CU and IG/IS-NT it is not allowed to operate NT-Converter on site where relative power management is required. For proper function of power management ABS (kW) mode has to be used (Setpoints > Pwr management > #Pwr mgmt mode).

2.2.1 Jumpers configuration

Jumper	Meaning
MODE 1-5	Analog Load Sharing line mode selection
CAN R	Terminating CAN resistors 120 Ω
BOOT	Switches to boot mode which allows optional firmware upgrade

Mode Jumper	Meaning
0 = no jumper	ComAp mode (compatible with IG/IS classic Load Sharing line)
1	Output range 0-3 V; compatible with: ❯ Woodward LSM (26011)
2	Output range 0-4.5 V; compatible with: ❯ Woodward 723 Plus ❯ Woodward 828 Digital control ❯ Barber-Colman Pow-R-Con
3	Output range 0-2.5V, compatible with: ❯ Cummins PCC 3.3 (kW sharing) *Note: Converter CAN address is fixed to 32.*
4	Output Range 0-2.5V, compatible with: ❯ Cummins PCC 3330 (VAr sharing) *Note: Converter CAN address is fixed to 31.*

*Note: All **MODE** jumpers are **OPEN** by default. This means ComAp mode is selected.*

*CAN R jumper is **CLOSED** by default at IG/IS-NT CAN bus side and **OPEN** at IG/IS classic side.*

2.3 Can bus configuration

2.3.1 CAN bus address configuration

NT-Converter occupies address 32 of the address range, so it is prohibited to use this address for another controller connected to the system. Addresses up to 31 can be used arbitrarily. Adresses up to 30 are then available.

In case of the usage of a jumper in the position 4, the converter occupies CAN address 31. For more information **see Jumpers configuration on page 6**.

2.3.2 CAN bus speed configuration

The Communication can be realized in 32C or 8C mode. Speed is obtained after each CAN bus reconnection (LED RUN is flickering with 1 s period). NT-Converter switches on the LED RUN when IG/IS-NT controller is detected. First there is detection of which takes 10 seconds and then there is detection of IG/IS-CU for another 10 seconds. When NT-Converter doesn't have communication via CAN bus with IG/IS-NT then LED RUN starts flickering. Detection of IG/IS-CU disconnection from CAN bus is not implemented. When speed cannot be obtained from IG/IS-CU CAN bus for 10 seconds the communication won't working successfully. We recommend connect CAN lines, turn on the controllers and then turn on the NT-Converter.

2.3.3 CAN bus length of wiring

The wiring length depends of using communication speed. Check CAN bus mode Setpoint in the controller settings, for mode:

> 8C – CAN bus length can be up to 900 m,
> 32C – CAN bus length can be up to 200 m.

The length of wiring is counted from the controller to the NT-Converter or from the NT-Converter to the controller. It means at 32C mode, the maximum length can be 400 m (200 m + 200 m).
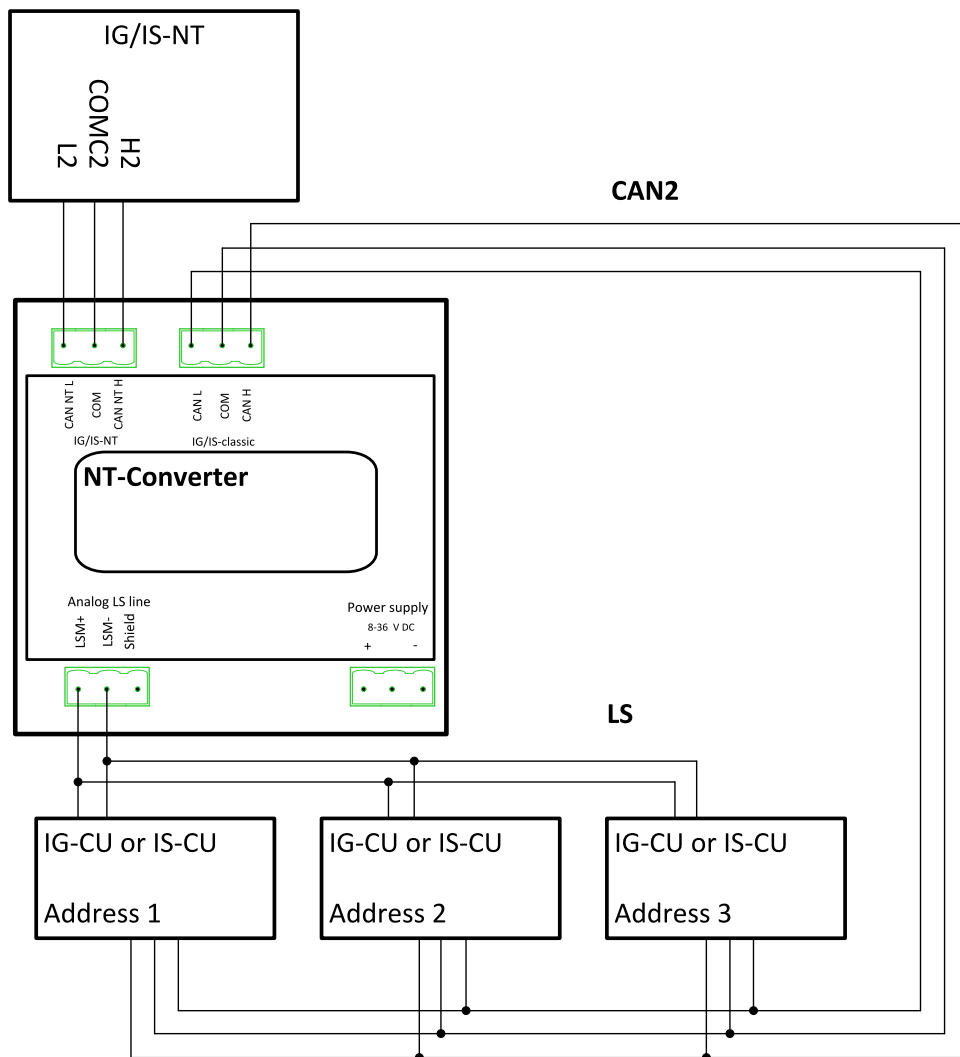
3 Installation and wiring

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3.1 Connection to IG-CU or IS-CU system

> Connect IG/IS-NT via its CAN2 bus interface (Intercontroller & monitoring).

> Extend the existing Load Sharing line between IG-CU or IS-CU controllers to NT-Converter terminals. Use shielded wire. The shield can be connected to the appropriate terminal at NT-Converter as well (if not connected to some other controller yet).

> Select the ComAp NT-Converter mode according to **Jumpers configuration (page 6)**.

> In ComAp mode connection of IG/IS-CU via CAN bus to IG/IS-CU (classic) connector on NT-Converter is recommended.

3.2 Connection to MINT with two IG-NT
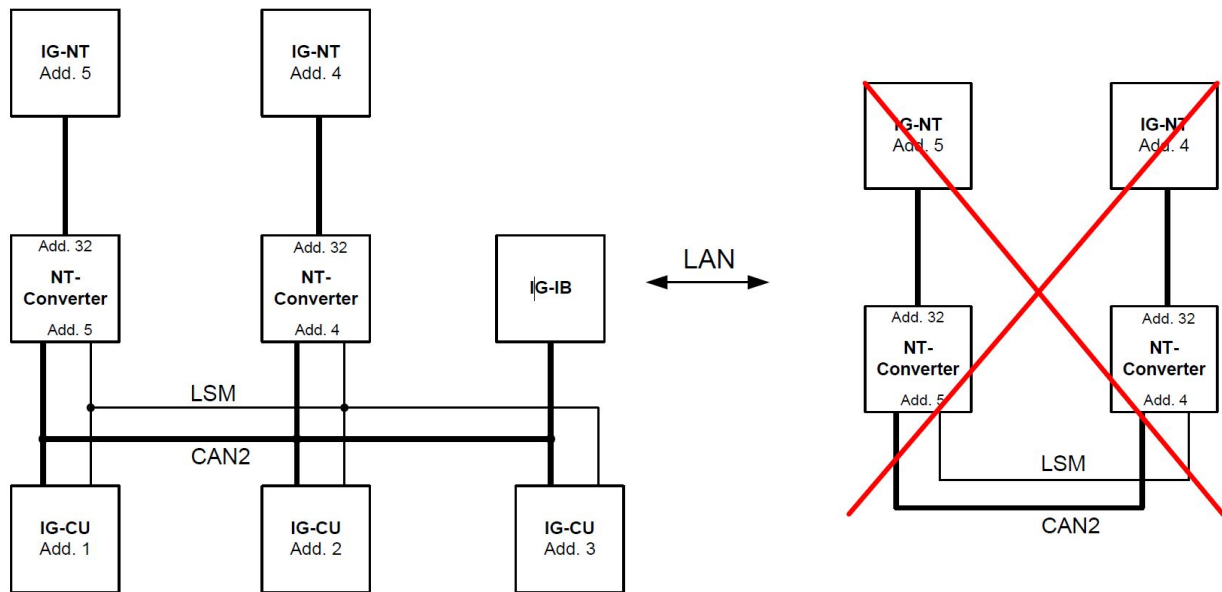
> More logical groups of NT controllers cannot be used.

> Functions of IGS-NT controllers are reduced to ones of the classic line.

> Each IGS-NT has to be connected to the existing CAN2 (of classic line) and analog LS (of classic line) by its NT-Converter.

> The address 32 is default address for each NT-Converter. NT-Converter transforms messages that are sending via CAN2 NT-line to CAN2 classic-line.

> Address in NT-Converter cannot be changed.

> NT-Converter is not visible in InteliMonitor, MultiEdit and other ComAp monitoring SW.

> For controller monitoring can be used InteliMonitor, WinEdit and all other monitoring SW.

Note: Connection is possible via IG-IB, IG-MU, I-LB / I-LB+.

3.3 Connection to third-party system
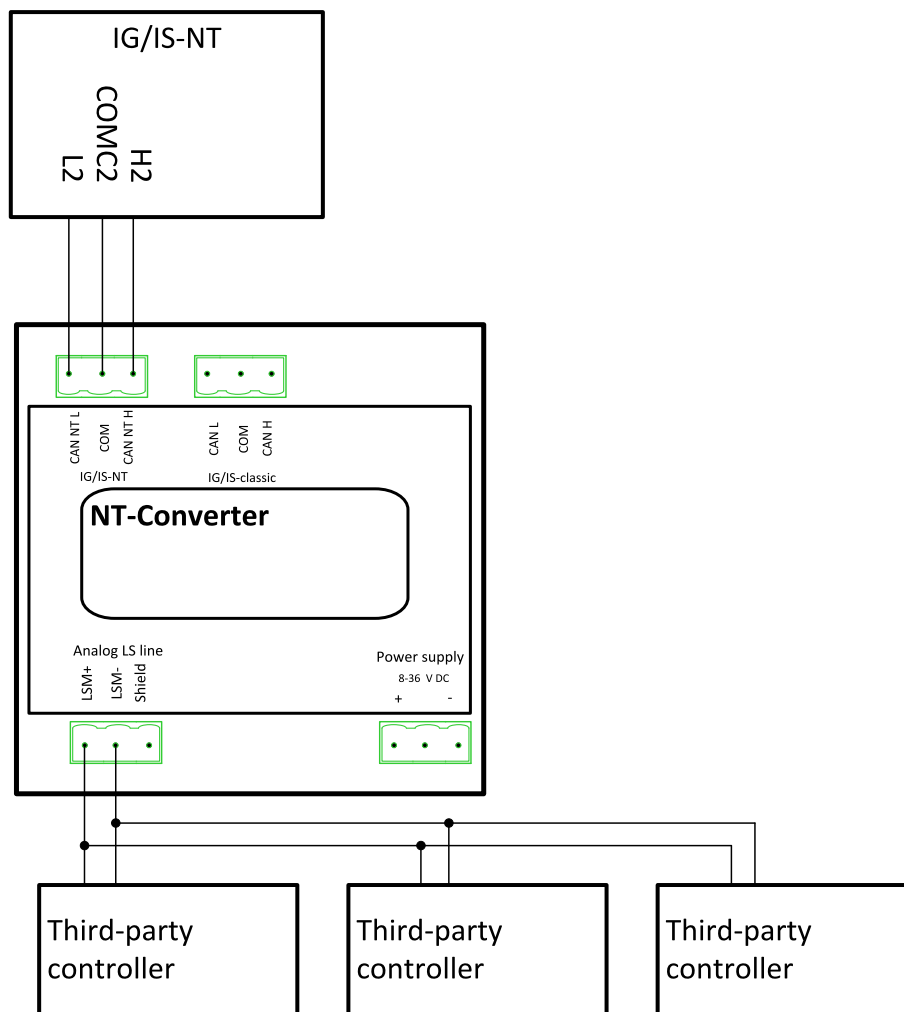
> Connect IG/IS-NT via it's CAN2 bus interface (Intercontroller & monitoring).

> Extend the existing Load Sharing line among third-party controllers to NT-Converter terminals. Use shielded wire. The shield can be connected to the appropriate terminal at NT-Converter as well (if not connected to some other controller yet).

> Follow the documentation and/or terminal descriptions of the existing controllers to determine which of the two Load Sharing line wires is positive and connect this one to LSM+ terminal at NT-Converter.

> Select the appropriate NT-Converter mode according to the table in **Jumpers configuration (page 6)**.
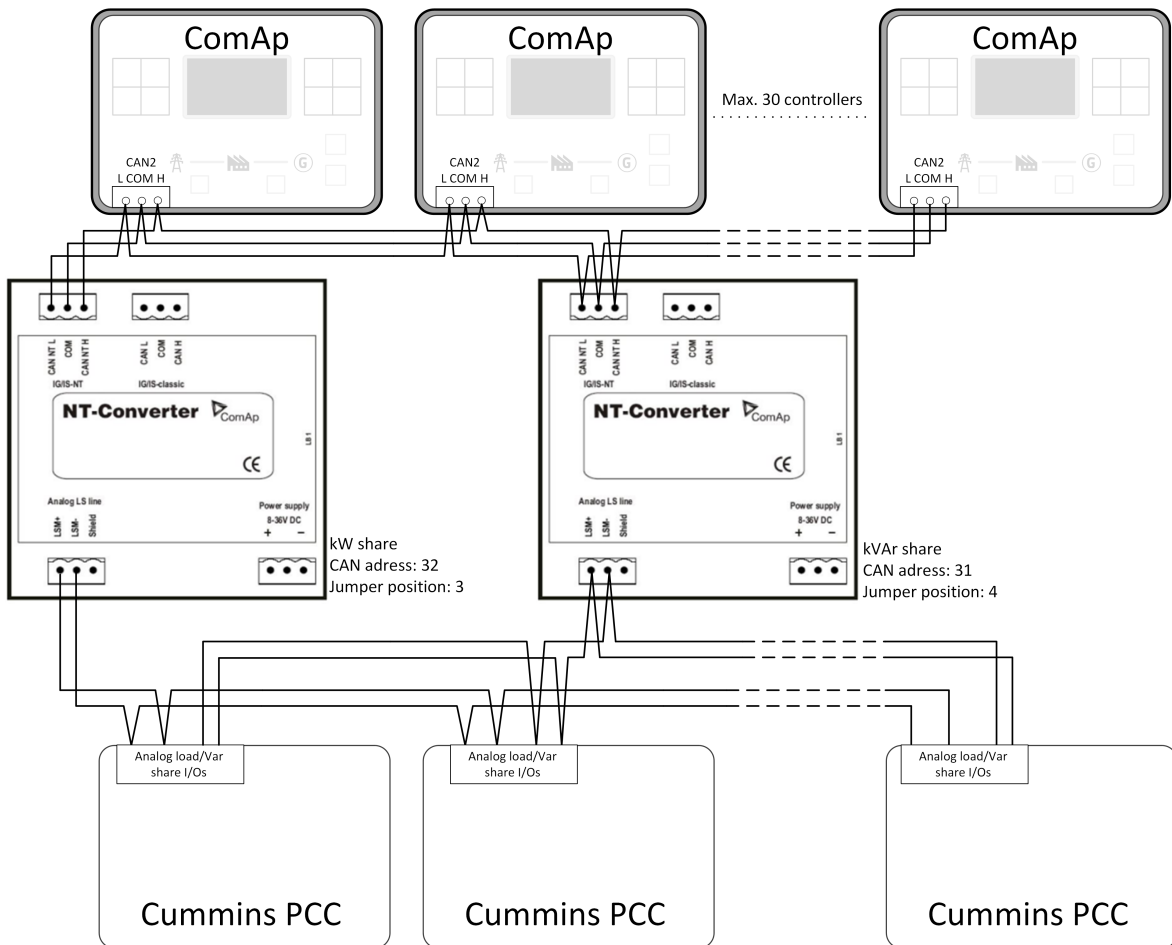
# 3.3.1 Connection to Cummins PCC

Image 3.1 Total topology

> Connect ComAp controllers (InteliGen / InteliSys) and NT-Converters over the CAN line used for inter-controller communication

> For supporting both load and VAr sharing, two NT-Converter are required – one for kW and the other one for kVAr sharing (overall 2 NT-Converters are required for the installation/site)

> The maximum number of ComAp controllers connected over CAN line is 30 having CAN addresses from 1 to 30 (addresses 31 and 32 are dedicated to the NT-Converters)

> Connect the Cummins PCC controllers over the analog line with the appropriate inputs/outputs on the NT-Converter

> Set the jumpers in the NT-Converter according to **Jumpers configuration (page 6)**.

4 Controller setup

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4.1 Terminals and dimensions
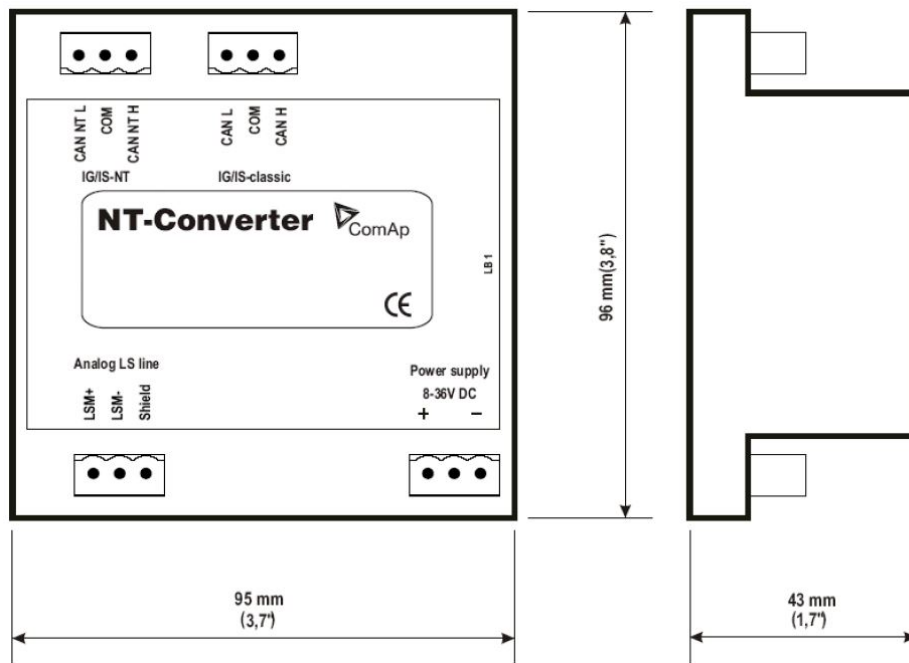
5 Technical data

Power supply

Voltage input	8-36 V DC
Consumption	0.1 A (depends on Power supply)

Operating conditions

Operating temperature	-40 ˚C to +70 ˚C
Storage temperature	-40 ˚C to +80 ˚C
Humidity	85 % w/o condensation
Protection	IP20
Standard conformity	

Dimensions and weight

Dimensions	95 × 96 × 43 mm DIN rail (35 mm) mounted
Weight	250 g

Analog output

Load sharing output	±5 / ±10 V DC impedance 10-50 kΩ

CAN bus interface

Maximal CAN bus length	200 m / 900 m
Speed	250 kBd / 50 kBd
Nominal impedance	120 Ω
Cable type for IG/IS-NT connection	twisted pair, shielded

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