

Specifications

Input Interface	RS485 for net control and data acquisition
Output Interface	RS232 for connection to PC
Baud Rate	max. 9600 bps
Supported Devices	up to 32
Device Groups	up to 8
Power Supply	mains adapter 9 VAC/DC
Consumption	max. 90 mA
Operating Temperature / Humidity	0...50 °C / 0...80% RH
Protection Class: front / terminals	IP54 / IP20

Warranty and Support

.....
serial number

.....
manufacturing date

QC check mark(passed)
(stamp)

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Warranty

COMECO warrants this product to be free from defects in materials and workmanship for 2 years. If your unit is found to be defective within that time, we will promptly repair or replace it. This warranty does not cover accidental damage, wear or tear, or consequential or incidental loss. This warranty does not cover any defects caused by wrong transportation, storage, installation, or operating (see 'Specifications').

Technical support

In the unlikely event that you encounter a problem with your COMECO device, please call your local dealer or contact directly our support team.

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v1-12.08



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INTERFACE ADAPTER

IA100

OPERATION MANUAL



Please read this Operation Manual before mounting and operating!
Save the Manual for future references!

Networking

Biasing

- ◆ When the network is in idle state, all nodes are in listen (receive) mode. Under this condition, there are no active drivers on the network. All drivers are tri-stated.
- ◆ Without anything driving the network, the state of the line is unknown. The logic level at the output of the receivers, when the line is in this state, is '1', which, according to RS485 specification, is coded by at least of 200 mV voltage drop between **B** and **A** data lines.
- ◆ In order for the interface adapter to maintain the proper idle voltage state, bias resistors must be applied to force the data lines to the idle condition.
- ◆ Bias resistors are nothing more than a pull-up resistor on the data **B** line (typically +5 V) and a pull-down (to ground) on the data **A** line. The value of the bias resistor is dependent on termination type and the number of nodes in the system as well as the load impedance of the node receiver. The goal is to generate enough DC bias current in the network to maintain a minimum of 200 mV between the **B** and **A** data line.
- ◆ On the other hand, to reduce the consumption and to assure a stable '0' state on the line, we recommend a value of **B** - **A** voltage drop of less than 500 mV.

Protection against electro-magnetic interferences

A good decision to protect the network against inductive spikes is connecting the signal grounds of all nodes to the earth via 100 Ω resistors.

Networking

Wiring

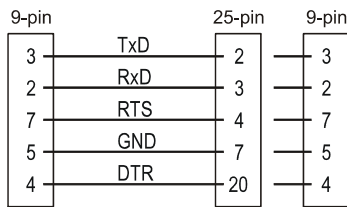
- ◆ Use two-wire half-duplex communication.
- ◆ Note that the signal ground line should also be connected to the system. This connection is necessary for keeping the V_{cm} common mode voltage at the receiver within a safe range. The interface circuit may operate without the signal ground connection, but in such case, reliability and noise immunity may be sacrificed.
- ◆ To configure the network, use a shielded cable with at least two dedicated pairs of wires. The shield must be one-point connected to the signal ground (the ground terminal of IA100 is preferable).
- ◆ Use one of the dedicated pairs as a communication line and the other one as a node-grounding conductor.
- ◆ Using more than 32 nodes is not recommended.



Important note:

According to the RS485 specification, each node has a load impedance of 12 k Ω . Thus, the total number of nodes is restricted to 32. Since there are interface chips with higher receiver load impedance, which allow extending the total number of nodes, we recommend you to measure the load impedances during network configuration.

Connecting



IA100

PC

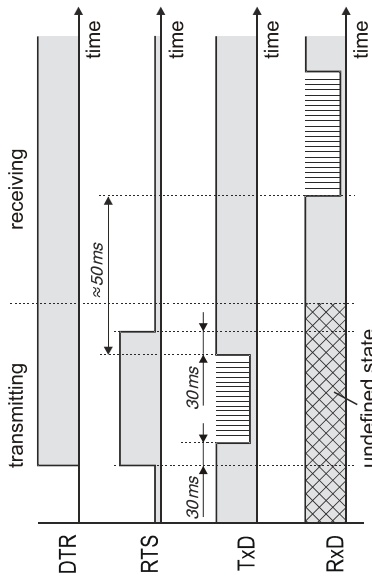
- ◆ Connect IA100 to PC via RS232 serial port. Note that not all RS232 signals should be used to create a connection between the adapter and the PC.

- ◆ The RS232 part is powered through the communication port. Therefore, adherence to the data transmitting / receiving protocol as illustrated on the left is crucial.
- ◆ Since, during transmission, RxD signal state is undefined, we recommend you to clear the receiving buffer after each transmission.

- ◆ On the other hand, connect the interface adapter to the control device network, according to the RS485 specification (see 'Networking').



The two IA100 interfaces are optically isolated.



Declaration of Conformity



The undersigned hereby declares, on behalf of COMECO Inc., that this device has been manufactured in compliance with standards EN 61000 and EN 61010, and meets the requirements of Directives 73/23/EEC and 89/336/EEC.

[Signature]

Vladimir Sakaliyski
CEO
COMECO Inc.

Waste Disposal



Do not dispose of electronic devices together with household waste material!

If disposed of within European Union, this product should be treated and recycled in accordance with the laws of your jurisdiction implementing the WEEE Directive 2002/96 on the Waste Electrical and Electronic Equipment.

Networking

Termination

- ◆ Termination is used to match the impedance of a node to the impedance of the transmission line being used. When impedances are mismatched, the transmitted signal is not completely absorbed by the load and a portion of it is reflected back into the transmission line. If the source, transmission line, and load impedance are equal, these reflections are eliminated.
- ◆ Termination increases load on the drivers and the installation complexity, changes biasing requirements, and makes system modification more difficult.
- ◆ The decision whether or not to use termination should be based on the cable length and data rate used by the system. A good rule of thumb is that if the propagation delay of the data line is much less than one bit width, termination is not needed.
- ◆ There are several methods for terminating data lines. The method we recommend is adding a resistor in parallel with the receiver's A and B lines, only at the extreme ends of data line. The resistors' value should be equal to the characteristic impedance of the line (120 Ω is a common value). A termination resistor of less than 90 Ω should not be used.
- ◆ Another type of termination is through addition of a small capacitor in series with the termination resistor. Although this method eliminates DC loading, capacitor selection is highly dependent on system properties.

