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TROX® TECHNIK

Product Information TROXNETCOM-AS-Interface AS-i Controller Using and programming software

PI/7.1/6/EN/1

AS-i controllers
TNC-A1303, TNC-A1304, TNC-A1305, TNC-A1306, TNC-A1335

The controller (AS-i master) carries out all management functions. This means that it initializes the AS-i Interface, identifies all bus stations, and generates error diagnoses and their corresponding error messages.
The AS-i master device also controls data transmission to the bus line and cyclically polls data from all slaves. The data in all connected slaves is available, and saved, in the controller.
Each Controller can run a maximum of 31 slaves. A dual controller can run twice that number. The controllers provide interfaces (gateway functions) to higher-order central processing units or control modules such as RS232, Profibus DP, CAN and Ethernet.
Virtually all measurement and controlling technology suppliers can integrate AS-i directly into your building management system.
The controllers can be networked together, thereby allowing standalone systems to be set up without the need for any tie-in to a central processing unit.
Relatively little programming is needed for the central processing unit, because the controller has a complete image of the infrastructure, in which conversion to the higher-order bus protocol has already taken place. From a programming standpoint, the AS Interface controller is treated like a station of the higher-level buses and is thus a slave of the higher-level system.
AS-i networks save the user the programming costs incurred with other systems for the realization of gateway functions.
Thus, integration of an AS-i network into a higher-level bus system is no problem whatsoever. All that is needed are the relevant hardware, i.e. an AS-i controller connected to the compatible interface. The management functions of an AS-i controller are completely independent of higher-level systems. These only access controller data fields – for example, status of the inputs, outputs, parameters etc. – either when reading (e.g., for inputs) or writing (e.g., for outputs).
Unlike conventional relay tie-ins, which can only route collective fault indicators to higher-level central units, the components in this network can realize data connections that allow all infrastructure components to be monitored and all actions to be undertaken from a higher-level central processing unit.
The display/operating panel can be connected to each controller. In addition to allowing a tie-in to be realized to a higher-level central processing unit, control and visualization fields can also be integrated at any location.
In addition to management functions, the controller can also undertake regulation and control functions. To this end, the controller should be programmed like an SPS, using the standard programming language compliant with IEC 61131-3, either graphically or with the aid of a list of instructions.

How the controller (AS-i master) works

The controller detects errors and enables communication between the connected slaves. It also supports such functions as automatic address programming.

Three lists: LPS, LDS, LAS

To ascertain states, the controller generates three lists per AS-i master segment. The “List of configured slaves” (LCS) is written to non-volatile memory during the commissioning process. This reference list contains the addresses of all currently installed slaves, together with their respective E/A configurations and ID codes.

The controller continuously monitors all connected slaves, as well as any that are added or removed. This data is saved in the “List of detected slaves” LDS).

The third list is the “List of activated slaves” (LAS). It contains all slaves that have been detected and that are involved in data communication.

Automatic address programming; failure of individual slaves

This function allows for easy replacement of defective components without any special tools, addressing units or the like. The controller detects defective (missing) slaves by comparing LPS and LAS. Their designations are displayed so that they can be replaced. The “new” slave must of course be assigned the same address as its predecessor.
If the “Auto-Addressing_enable” function is enabled in the controller, this slave can be directly integrated into the factory default settings (whose address is 0). The controller performs address programming automatically via the bus cable. During this process, normal data exchange between the other modules continues.
For security reasons, the controller also automatically monitors the profiles of “old” and “new” slaves, in order to ensure that components are replaced with exactly the same type of partIf a 4-way output module is inadvertently installed instead of a 4-way input module, addressing will not be performed and the error message will remain on the screen.

Controller (AS-i master) operating modes

Each controller has two operating modes between which the user can switch. The manner in which this occurs is not standardized. Therefore, the user should consult the operating manual to learn how this is done.

Configuring mode

As its name suggests, configuring/commissioning mode is used only for planning or commissioning, or for servicing or maintenance purposes. In this mode, data is exchanged with all connected slaves in the LDS. Configuring (LCS) is not taken into account. Functions such as “Detect missing slaves” and “Automatic addressing” are not activated.

Protected mode

After performance of the hardware test, the controller switches to safe operating mode. This can only be done if no slave with the address ”0” is present in the AS-i network, because only slaves 1-31 are permissible in safe operating mode.
Unlike in configuring mode, in safe operating mode only those slaves are activated that was configured ahead of time, i.e. that appear in LCS. No additional slaves participate in the data communication.

The AS-i controllers we utilize successfully combine three components. The controller contains a complete AS-i master, a miniature SPS (freely programmable control module) and a field bus connection. All of these components can be operated in a mixed system, either as standalone components, decentralized central signal preprocessing units, or as gateways.
The control module is programmable in a modern, standardized programming language that complies with IEC 61131-3 and that other control modules are compatible with. Thus, the user need not waste time learning to use a new SPS language.
In combined mode, digital E/A data from the AS-i can be processed directly and the results can be transmitted to the building management system via, for example, the Profibus DB interface.
These benefits the user in that it saves space, provides a decentralized solution that drastically reduces building management system costs, and last but not least translates into an excellent price/performance ratio.

The next section contains technical data for the most commonly used controllers.
These controllers are equipped without any communication port or.

A large number of other controllers with a range of ports is available.
For further information, please contact our representative.

AS-i Controller
TNC-A1303, TNC-A1304, TNC-A1305 and TNC-A1306

The AS-i ControllerE family represents a further development of the tried and tested AS-i Controller. These units feature 1 or 2 masters based on AS-i Version 2.1.
The integrated text/graphics display of the ControllerE facilitates detailed system diagnosis. Operation with the four buttons can be learned intuitively.
Intelligent message management generates priority-controlled text messages, thus ensuring the most important messages are displayed first.
Effectively protected against power failure, the 1 Mbyte flash memory stores the operating system, the PLC program as well as remanent data. The programs are then executed at high speed in the SRAM which also has a capacity of 1 Mbyte.
The serial programming interface (RS 232 C with RJ45 socket) allows for convenient project planning and programming using a PC with baud rates of up to 115 Kbaud.
Besides even faster programming and diagnosis, with the optional Ethernet programming interface (10/100 MBd twisted pair), the controller can also be networked together with other ControllerE units.
The versatile optional field bus interfaces facilitate connection to a higher-level field bus such as Profibus-DP, DeviceNet, CanOpen, EthernetIP, etc., allowing operation as a decentralised controller or as a convenient gateway.

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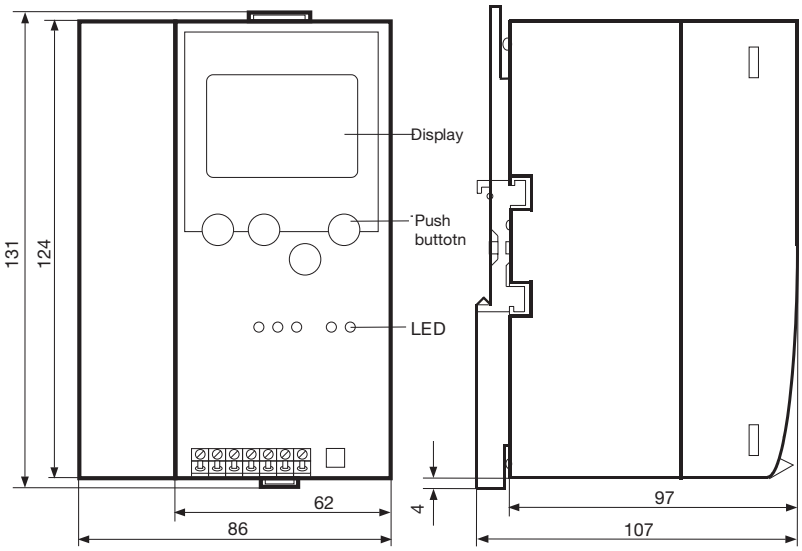
AS-i Controllers TNC-A1303, TNC-A1304

The AS-i Controller TNC-A1303 and TNC-A1304 are compact, industrial AS-i master systems with integrated text/graphics display that can be used as a standalone control system. They are equipped with an RS232C interface – other field bus interfaces are not included.

These controllers are used in small-scale installations with a maximum of 31 or 62 AS-i slaves.

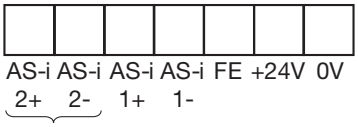
TNC-A1303 AS-i Controller with integrated display and 1 master
TNC-A1304 AS-i Controller with integrated display and 2 masters



Technical data

Order code	**TNC-A1303 / TNC-A1304**
Operating voltage [V]	24 DC
Current consumption incl. motor [mA]	< 400
Power consumption [VA]	< 10
Programming interface	RS232C: RJ11; 9600...115200 Baud, galavanically isolated
PLC memory for user program [Kwords]	128
Display	Full graphic LC-display 128 x 64 pixels, 43 x 28 mm
Max. relative air humidity [%]	< 95
Function display LED	1x red; 2 x green; 2 x yellow (TNC-A1303) 2 x red; 3 x green; 3 x yellow (TNC-A1304)
Operating temperature [°C]	0...+60
Storage temperature [°C]	–20...+70
Protection class	IP20
AS-i profile	M1e
AS-i certificate	61101
Housing material	Aluminium
Dimensions (L x W x H) [mm]	124 x 97 x 86
Mounting	possible on DIN rail

Wiring



TNC-A1303 not used

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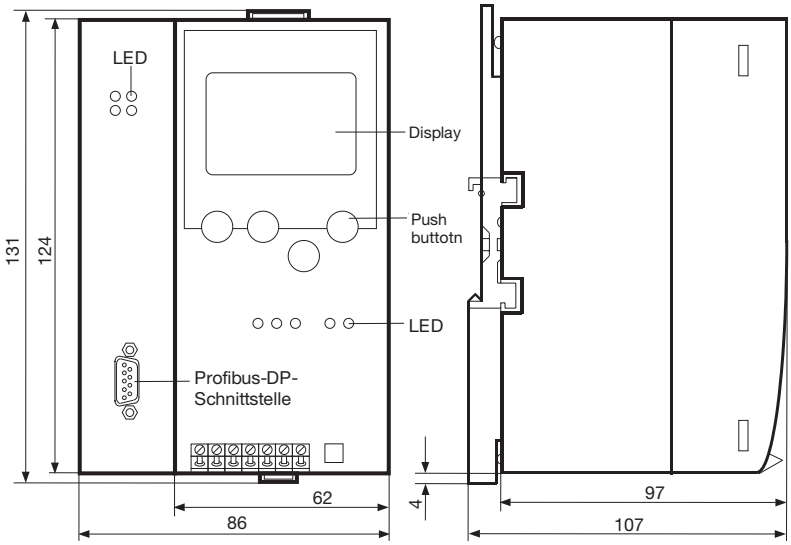
AS-i Controllers TNC-A1305, TNC-A1306

The AS-i Controller TNC-A1305 and TNC-A1306 are compact, industrial AS-i master systems with integrated text/graphics display and Profibus DP interface.

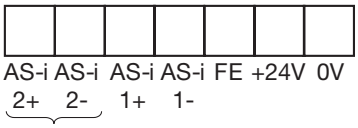
TNC-A1305 AS-i Controller with integrated display and 1 master
TNC-A1306 AS-i Controller with integrated display and 2 masters



Technical data

Order code	**TNC-A1305 / TNC-A1306**
Operating voltage [V]	24 DC
Current consumption incl. motor [mA]	< 400
Power consumption [VA]	< 10
Programming interface	RS232C: RJ11; 9600...115200 Baud, galavanically isolated
Data interface	Profibus DP (EN 50170); max. 12 Mbaud Slave
Diagnosis via Profibus DP	Profibus DP (EN 50170); max. 12Mbaud
PLC memory for user program [Kwords]	128
Display	Full graphic LC-display 128 x 64 pixels, 43 x 28 mm
Max. relative air humidity [%]	< 95
Function display LED	2x red; 2 x green; 2 x yellow (TNC-A1305) 3 x red; 3 x green; 3 x yellow (TNC-A1306)
Operating temperature [°C]	0...+60
Storage temperature [°C]	–20...+70
Protection class	IP20
AS-i profile	M3
AS-i certificate	61103
Housing material	Aluminium
Dimensions (L x W x H) [mm]	124 x 97 x 86
Mounting	possible on DIN rail

Wiring



TNC-A1305 not used!

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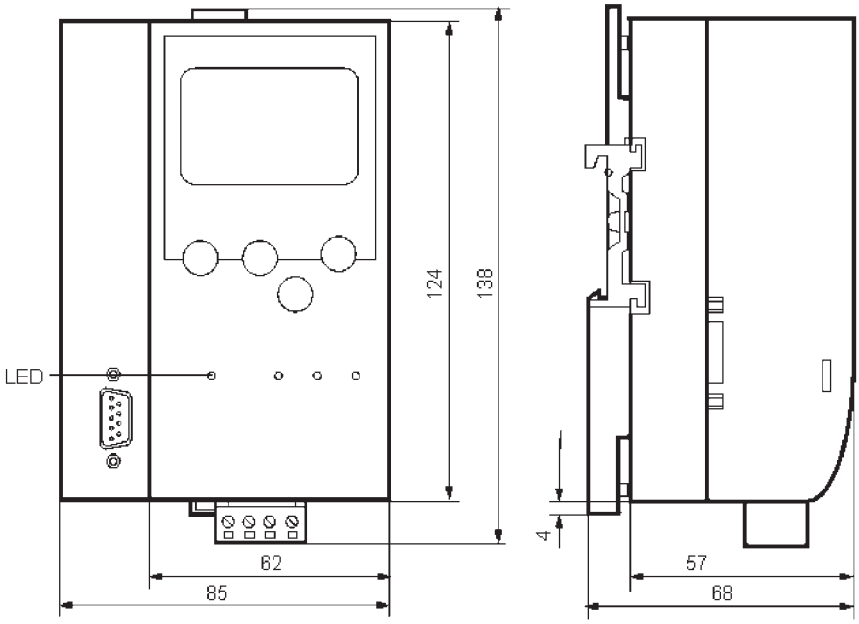
AS-i Gateway TNC-A1335

SmartLink DP
AS-I Gateway / Profibus DP
Full master functions, without data handling



Technical data

Order code	**TNC-A1335**
Operating voltage [V]	26.5 ... 31.6 DC (AS-i)
Current consumption incl. motor [mA]	< 200
Power consumption [VA]	< 4
Data interface	Profibus DP (EN 50170); max. 12Mbaud Slave
Diagnosis via Profibus DP	Profibus DP (EN 50170); max. 12Mbaud
Display	Full graphic LC-display 128 x 64 pixels, 43 x 28 mm
Max. relative air humidity [%]	< 95
Function display LED	2x red; 1 x green; 1 x yellow
Operating temperature [°C]	0...+60
Storage temperature [°C]	–20...+70
Protection class	IP20
AS-i profile	M3
AS-i certificate	63501
Housing material	Aluminium
Dimensions (L x W x H) [mm]	124 x 57 x 85
Mounting	possible on DIN rail

Wiring