

# Universal system for control application

## The AlfaStar

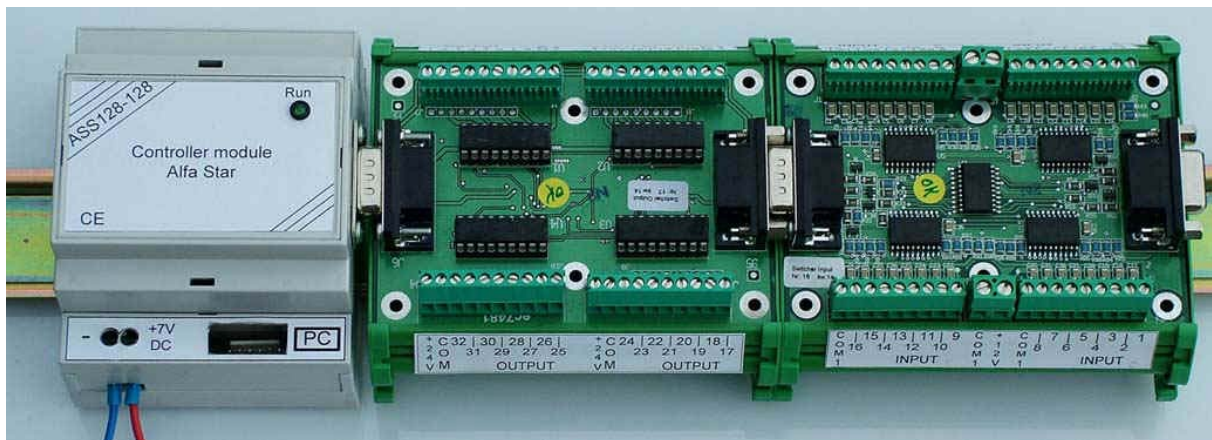
This document contains a technical description of a universal control system. It exists of 3 modules, the controller, the input module and the output module. The modules are interconnected via a bus that makes it easy to connect all modules in the system. The controller module contains firmware with which you can easily build an IO - system with up to 128 inputs and up to 128 outputs. The components necessary around it, are just standard switches, buttons and relays. Although it is developed for home control purposes, it can also be used for a wide range of applications.

## The controller module

This module is the intelligent part of the universal control system, applicable in home control and other systems. It contains a serial bus for communication with the input and output modules. A serial RS232 port makes the system controllable via a PC.



The controller is coupled to the I/O modules by means of the serial bus. Up to 4 modules of each can be coupled with the supplied firmware, so 128 inputs and 128 outputs are handled.



This control system contains the basic functionality of configuring inputs ( buttons) and outputs ( loads, lamps, light control, dimmers, ... ) with timer functionality and flexibility. Thus configuration can be accommodated continuously to the actual situation of living without the need to change wires. It increases flexibility, comfort and safety. All outputs have the same functionality, independent of the configuration. All outputs can be activated for a limited time, from less than 1 second to several days or endless. The system can be monitored with standard delivered PC-software and can even be controlled from a distant place. It is developed in a way that it is easily expandable by adding extra functionality that is compatible with the existing configuration.

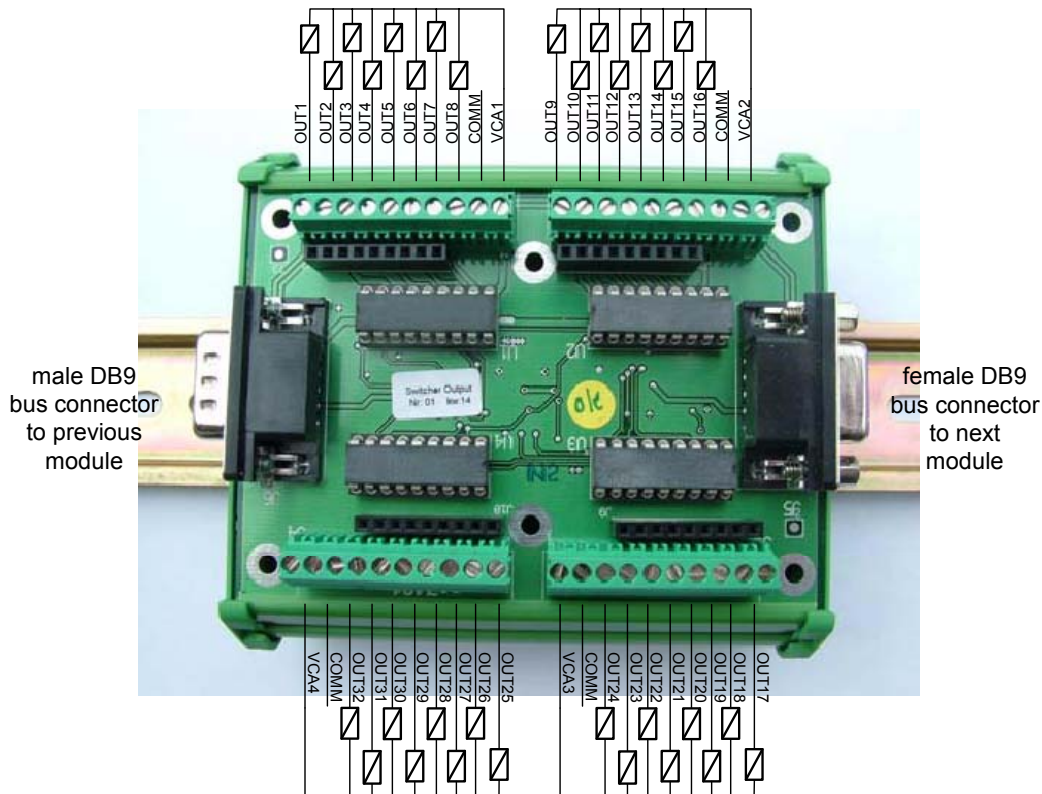
## Specification :

This specifications are continuously upgraded and expanded and will grow in the future according to the needs. Customs demand will be integrated if these are technically possible.

- 128 optical inputs with identical functionality in soft- and hardware.
- 128 relay driver outputs with identical functionality in soft- and hardware
- separate trigger on both edges for EACH input, long press and short press event detection
- 20 clock trigger with a week , 1 day, 1 hour, 1 minute or 1 second cycle (Each day is independently selectable)
- Each trigger can activate a sequence of different actions on one or more outputs.
- outputs can switched as
  - o toggle (ON/OFF)
  - o toggle with limited ON time
  - o monostable ( for a limited time )
  - o reset ( OFF )
  - o set (ON )
  - o astable ( flashing )
- delay on ALL outputs and each function except toggle with limited ON time.
- timing ( delay, on-time, off-time ) from 0.1 sec up to more than 113 hours (4days and 17 hours)
- Conditions on any sequence of actions, based on the status of inputs and/or outputs.
- Real – time functionality, all activities are executed simultaneously.
- RS232 serial port for configuration, monitoring and control.
- Real time simulation possible via PC, each button and each output can be manipulated via PC.

## The relay output module

This module is part of the universal control system, applicable in home control and other systems. It contains a serial bus for communication with the controller with which it can be controlled by a PC. All outputs are relay drivers. Four groups of 8 outputs can be controlled, each of them can have a different voltage (VCCA) to drive the relays. Up to 32 relays can be driven individually. One output can drive more than one relay. It is mounted in a housing for DIN-rail compatibility, but can also be mounted in any box with the 6 mounting holes.



### Specifications :

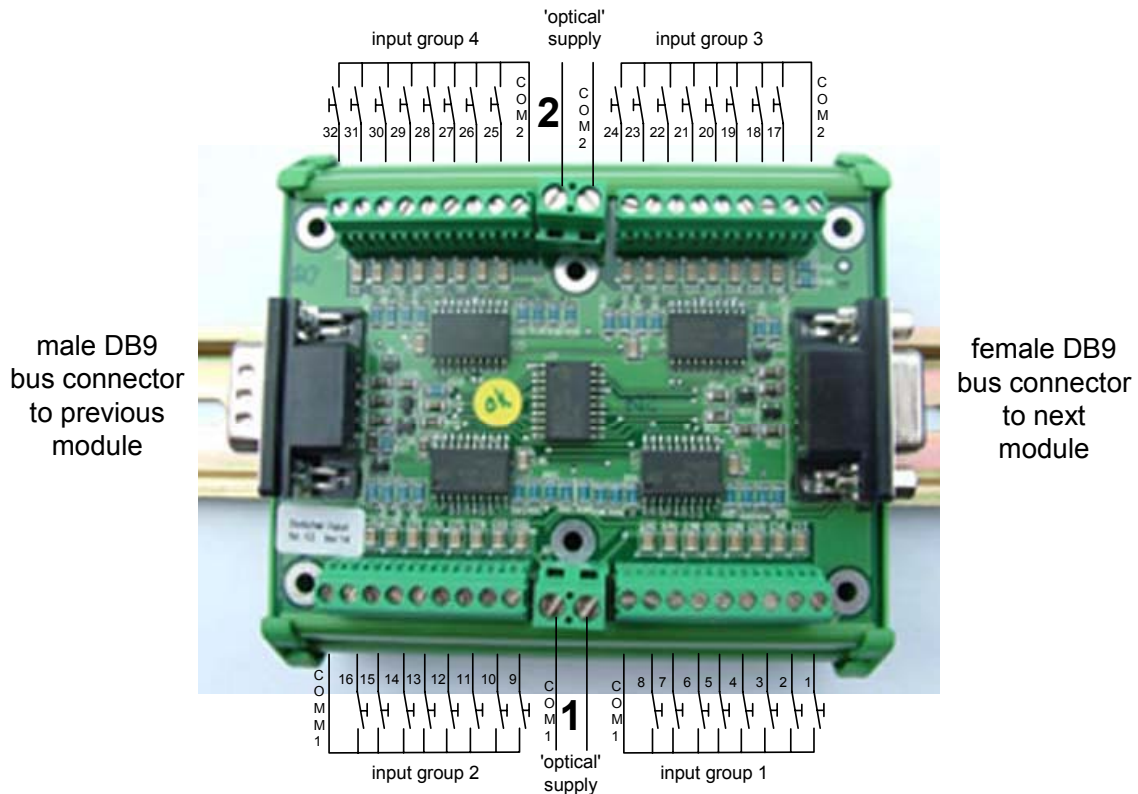
- 32 relay outputs, separate supply of 5 - 30 VDC on each connector
- VCA1..4 : 5- 30 VDC, can be independent or interconnected for each group of 8 outputs.
- 4 groups of 8 outputs with common pin and supply for each group ( 4 x 9 pin terminals)
- Sink current per group of max 800 mA, 200mA per output
- Loop through bus connector with SUB-D. Modules can be interconnected in cascade.
- Synchronous serial bus up to 500 kHz ( or even more )
- Outputs are latched by hardware at the same edge.
- Up to 4 modules connectable to the corresponding controller, this number can be increased almost unlimited by adjusting the bus speed. The number is physical not limited.
- Lowering clock frequency increases the acceptable number of modules.
- Connection to PC possible via simple interface.

### Mechanical specs :

- 6 mounting holes of 3.2mm.
- Width ca 100 mm, height 72mm
- PCB fits into mounting rail (see picture) that fits on standard DIN-rail.

# Optical input module

This module is part of the universal control system, applicable in home control and other IO-systems. It contains a serial bus for communication with the controller with which it can be read out by a PC. This module is meant to be used for reading out the status of switches, buttons and different kind of sensors.. Up to 32 individual inputs per module are implemented and are galvanically separated (or optically coupled) to the system. It is mounted in a housing for DIN rail compatibility, but can also be fixed in any box with the 6 mounting holes.



## Specifications :

- 32 optically coupled inputs, separate optical supply of 10 - 20 VDC on separate connector.
- 4 groups of 8 inputs with common pin for each group ( 4 x 9 pin terminals)
- Only a passive make/break contact necessary on each inputs. It is possible to connect several buttons to any single input.
- Loop through bus connector with SUB-D. Modules can be interconnected in cascade.
- Synchronous serial bus up to 500 kHz ( or even more )
- Inputs are sampled by hardware at the same edge.
- Up to 4 modules connectable to the corresponding controller, this number can be increased almost unlimited by adjusting the bus speed.
- Tested with up to 50m STP ( shielding = common ) or 25 m UTP cable. If necessary filtering can be further optimised by software.
- Connection to PC possible via simple interface.

## Mechanical specs :

- 6 mounting holes of 3.2mm.
- Width ca 100 mm, height 72mm
- PCB fits into mounting rail (see picture) that fits on standard DIN-rail.

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