



ROAD TRAFFIC
CONTROL

ASTER-40

ADAPTIVE CONTROLLER FOR ROAD TRAFFIC SIGNALLING



ASTER-40 adaptive controller may be used to control light signalling for small, medium and huge crossings both as a standalone device, and as line and/or area coordinated device.

Beyond control functions, controller features also metering functions for determination of traffic stream parameters within controlled crossing.

Measured data may be used for local control, but also transmitted to other controllers, connected within system.

In order to ensure maximum reliability, electronic circuits of controller are located within plastic housing that is equipped with heating system and forced ventilation system; ventilation is turned on according to internal temperature.

CONTROL FUNCTIONS

Depending on needs, controller may run one of the following control programs:

- Fixed-time programs that are switched by astronomical time clock or master device (controller or base unit);
- Fixed-time programs with phase duration adaptation (duration change, phase skip, traffic phase insertion) that may be used in coordination series;
- Cyclic programs with traffic phase adaptation;
- Adaptive non-cyclic programs that control individual signalling groups according to given conditions and restrictions (implementation of target function based control is possible, i.e. minimization of time losses on inlets according to inlet priorities, maximization of throughput in given directions, priorities for public transport vehicles and privileged vehicles, adaptation of tramway traffic).

Programs and program parameters may be switched according to weekly schedule.

Number of variations depends on controller's memory size and is practically unlimited.

MEASURING FUNCTIONS

Measurement of vehicles number that pass selected detectors; aggregation of measurement results for given time intervals.

Cooperation with Traffic Detection Station in order to use its data to implement control algorithms or to transfer data to Area Traffic Control network.

Cooperation with Automatic Meteorological Station, monitoring environmental parameters (air temperature, road temperature, humidity, wind velocity and direction, visibility).

COMMUNICATION FUNCTIONS

Controller is equipped with communication port (2 x RS485, RS232) and may directly or via external modems communicate with other devices over variety of transmission media (radiotelephones, trunking network systems, GSM networks, PSTN networks, leased lines).

When above transmission media are unavailable, simplified coordination using DCF clock module is possible.

COOPERATION WITH OTHER CONTROLLERS

ASTER-40 controller may be connected into coordination series containing different types of controllers:

- **LUS4/M** coordination is seamlessly accomplished according to transmission standard compatibility.
- **LUS-3T** - coordination may be accomplished once PK-3T/A40 coordination module is attached.
- **LUS-1T** see above, but PK-1T/A40 coordination module shall be used.

Third party controllers.

Having RS485 transmission channel, it is possible to achieve coordination by implementation of coordinated controller's protocol in ASTER-40 controller.

Coordination without RS485 channel is also possible using proper converter.

Simplified coordination is also possible by decoding states of selected signalling devices and putting them into ASTER-40 controller's inputs.

OPERATION IN CENTRALIZED TRAFFIC CONTROL SYSTEMS

Flexible hardware and software structure of ASTER-40 controller facilitates cooperation with almost any currently used traffic control system.

Being a part of traffic control system, ASTER-40 may operate as master device (master controller of area or communication series). This is accomplished by extended structure of transmission channels and possibility of configurable program modules.

In particular, this controller may be preferably used in systems, in which signaling plans are adjusted according to traffic status on adjacent crossings. Direct connection of controller (via modem) with traffic control system command center; command center, basing on traffic status data, updates implemented adaptive control program.

CONTROLLER OPERATION

In order to make maintenance team's work easier, ASTER-40 controller is equipped with operation monitoring function. This function provides with information about crossing current status, controller's module status, and detector inputs and other inputs states.

Beyond current data, controller provides also with information about emergency situations that occurred in the past. Such information may be received locally via controllers operator's console or remotely, via above transmission media and stored in database.

CONTROLLER'S SOFTWARE AND TESTING

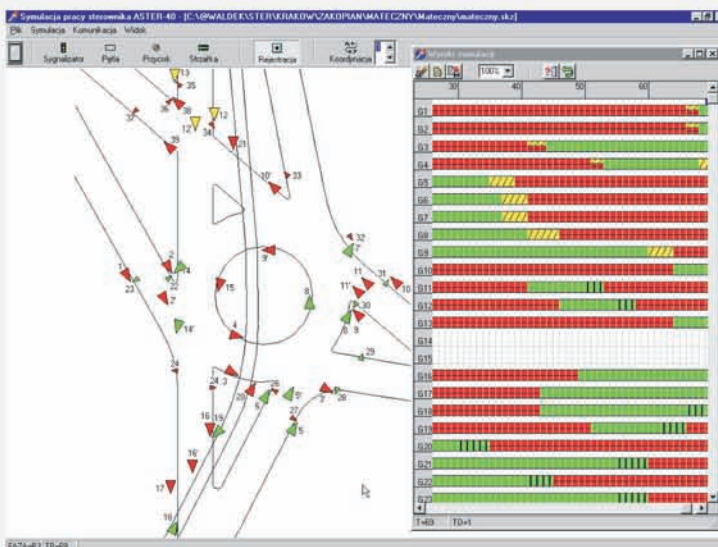
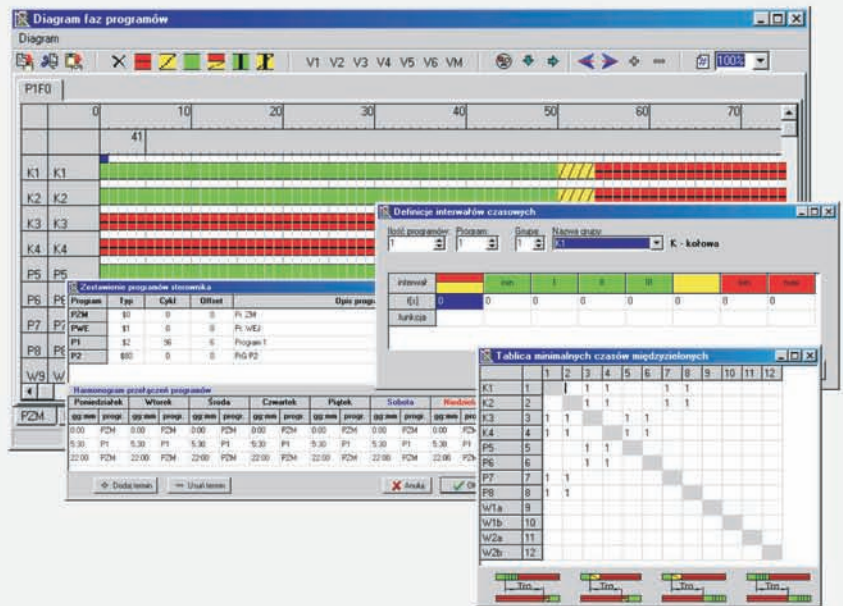
A40proj software

Complete program generator that runs under Microsoft Windows 9x/NT. Allows for easy, intuitive and user friendly creation of fixed-time and non-cyclic control algorithms.

Creation of program requires no programming knowledge and allows focusing on traffic-centric aspects of programming.

As a result, we receive complete binary file that shall be uploaded to controller's program memory (via RS232, modem, etc.), and complete software documentation, printed basing on data entered.

In case of programmers which want to take full advantages of ASTER-40 controller, A40proj generates C source program module; this module may be a baseline for creation of non-typical control algorithms.



A40sym software

This software may be used to test program module, generated by A40proj.

Testing includes two phases:

1. testing data, generated by A40proj without controller (software simulator);
2. testing of completely programmed controller.

In both phases, test results are presented graphically on semiautomatic crossing dummy and as time diagrams.

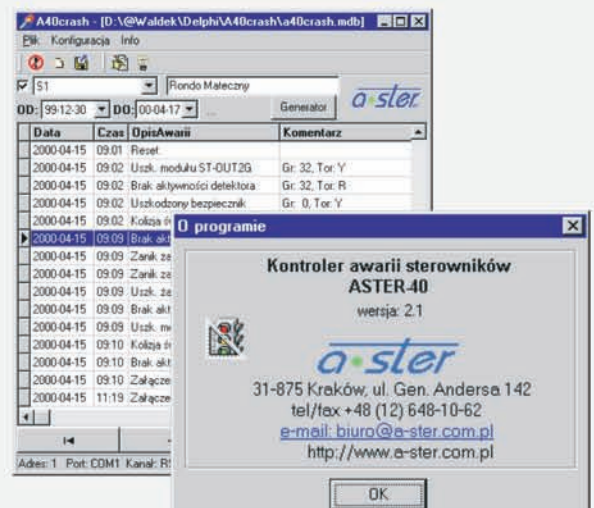
A40sym software facilitates vehicle detector operation monitoring and simulating of detector states. Quality of control may be also measured by measurement of real in-between times and comparing them to minimum times.

A40crash software

This software may be used to local or remote monitoring one or more ASTER-40 controller operation.

This software is useful tool for maintenance engineer, allowing for remote (e.g. via telephone) download of error memory and checking of correct controller operation.

Downloaded data are stored in database that allows for data analysis for any time interval, independently for each controller.



TECHNICAL SPECIFICATIONS

		ASTER 40/10	ASTER 40/20	ASTER 40/40
1.	Number of signalling groups	2-10	2-20	2-40
2.	Number of adaptive contact 24 V inputs	8	16	32
3.	Number of 24 V outputs	4	4	8
4.	Number of detectors supported	255	255	255
5.	Program step	1s		
6.	Controller's reaction to event	<0.1s		
7.	Maximum group current	3A		
8.	Lamp control	YES (for all circuits)		
9.	Fuse control	YES (for all circuits)		
10.	Ground fault and short-circuit control for cables	YES (for all circuits)		
11.	Single-phase power supply 220 (230) V, 50 Hz	80 W	40 W	80 W
12.	Main fuse	6 A	35 A	50 A
13.	Voltage shock protection	Earthing, neutral or ground fault interrupter		
14.	Auxiliary equipment	Heater and fan		
15.	Housing	IP54 (glass-epoxy laminate)		
16.	Housing dimensions	80 x 34 x 105 cm		54 x 34 x 80 cm

POWER SUPPLY

Controller is supplied by single-phase voltage.

Due to different voltage shock protection systems, controller may be supplied from the following lines:

- 2-wire (with protection earthing),
- 3-wire (with neutral earthing),
- 4-wire (with ground fault interrupter).

In order to ensure maximum protection during maintenance works, circuit breaker that facilitates visible circuit interruption.