



CENTRALIZED TRAFFIC CONTROL CTC-SIGNAL

CENTRALIZED TRAFFIC CONTROL CTC-SIGNAL

Centralized traffic control CTC is designed for monitoring and control of station and open line signaling devices included to the central traffic control operator's area.



Centralized traffic control provides the following functions:

- ✓ Management of the cargo transportation process at stations and open lines from one control center
- ✓ Central dispatch center operator's monitoring of the train situation at stations, open lines, level-crossings
- ✓ Track filling control at stations (if equipped with axle counting system)
- ✓ Cargo and wagons traffic monitoring at stations
- ✓ Train graph time schedule

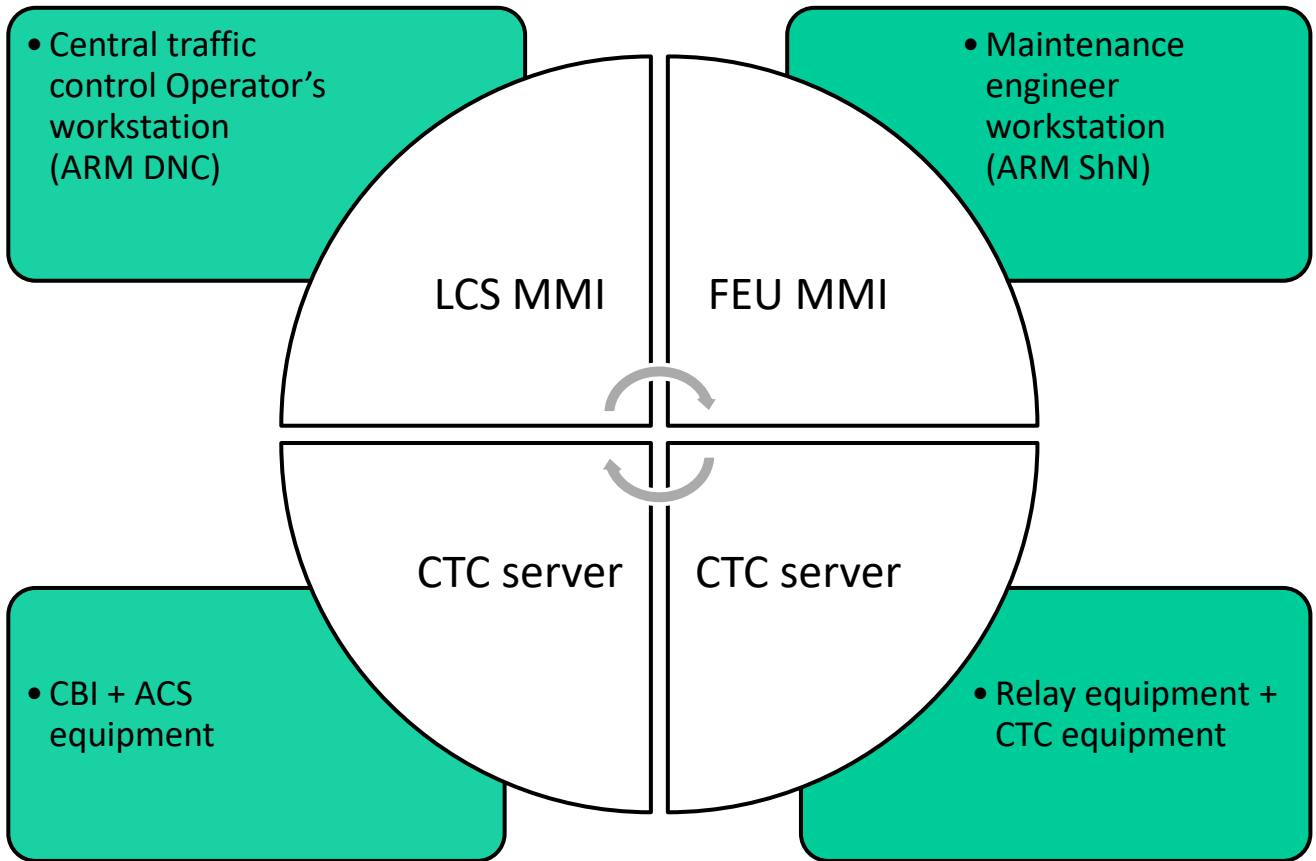


CENTRALIZED TRAFFIC CONTROL CTC-SIGNAL

- ✓ Registration and archiving of information about events related to the trains traffic and shunting operations, including faults of the signaling devices
- ✓ Automated transfer of information, converted into the special form, to the operators of supervisory control levels of train traffic control
- ✓ Automatic reporting of operational events with the ability to review archived data for 30 or more days
- ✓ Improvement of the traffic safety and the capacity of operated sections
- ✓ Reducing of operating costs, by increasing the reliability of the technical means operation
- ✓ Overall operational effectiveness due to using: monitoring and diagnostics of the signaling devices, the efficiency of decision-making on the control level of the traffic and technological process, the automation of a number of functions of operational management, accounting and registration

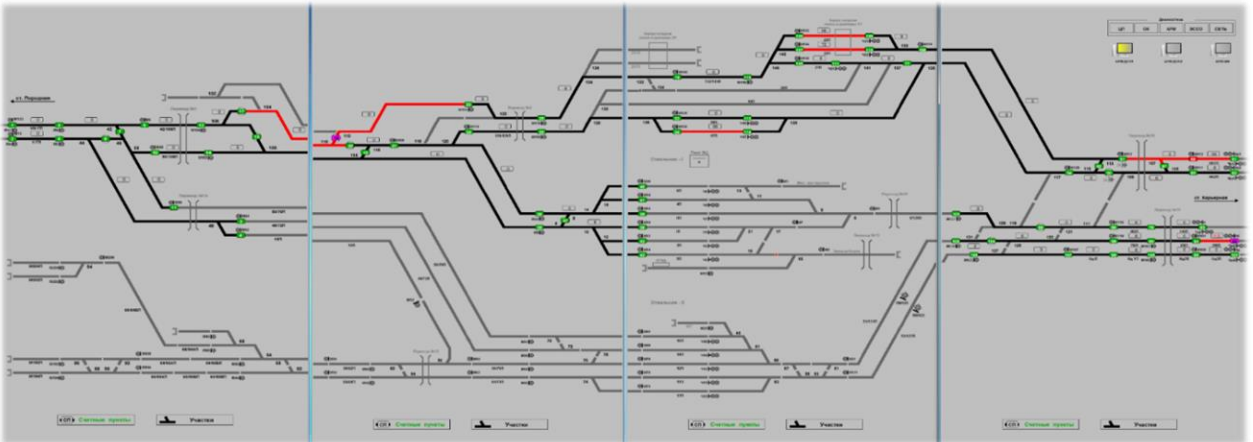


CENTRALIZED TRAFFIC CONTROL CTC-SIGNAL



GENERAL STRUCTURE



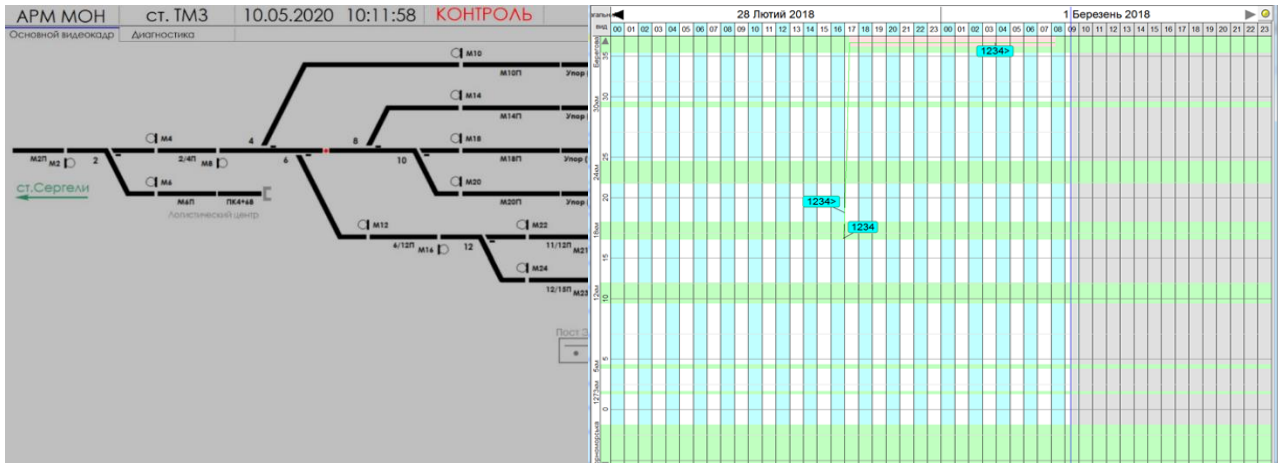
CENTRALIZED TRAFFIC CONTROL CTC-SIGNAL**OPERATOR'S WORKSTATION (ARM DSP)****OPERATOR'S WORKSTATION main functions:**

- ✓ station track layouts monitoring
- ✓ train situation with the number of the locomotives and train movement direction monitoring
- ✓ status of signaling devices monitoring
- ✓ control commands to ensure of the transportation process
- ✓ status of diagnostics of power supply devices, CBI and ACS monitoring
- ✓ service functions (user access, archive, event log)



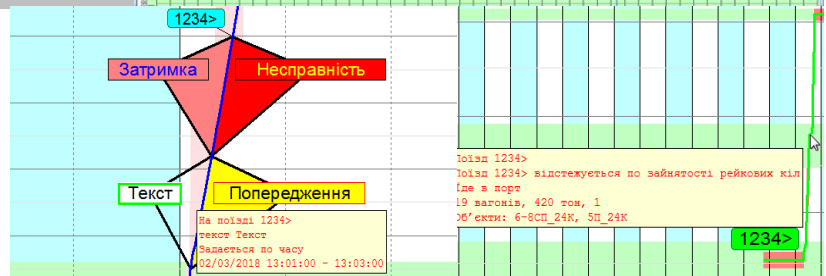
CENTRALIZED TRAFFIC CONTROL CTC-SIGNAL

CENTRAL TRAFFIC CONTROL OPERATOR'S WORKSTATION (ARM DNC)



CTC OPERATOR'S WORKSTATION main functions:

- ✓ status of station track layouts monitoring
- ✓ train graph time schedule execution
- ✓ status of wayside signaling devices monitoring
- ✓ diagnostics status of relay-based/CBI devices
- ✓ service functions (user access, archive, event log)
- ✓ display of information about cargo traffic at the station (track number, arrival time, name of cargo, type of wagon, time of wagon departure, downtime)
- ✓ event archive



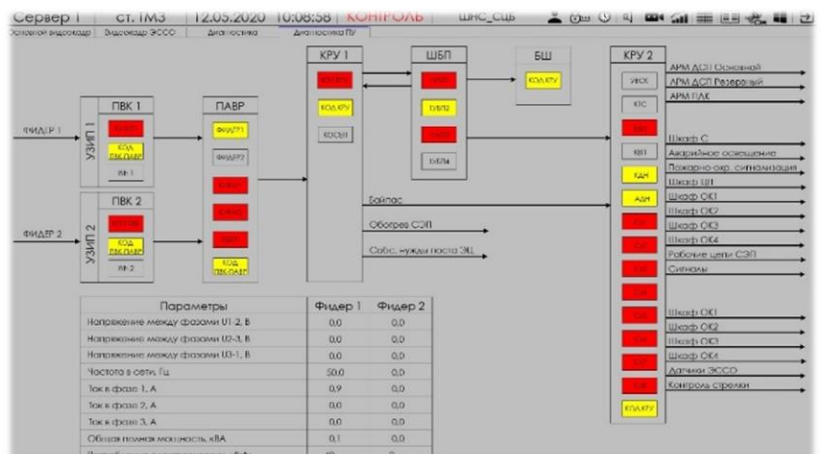
CENTRALIZED TRAFFIC CONTROL CTC-SIGNAL

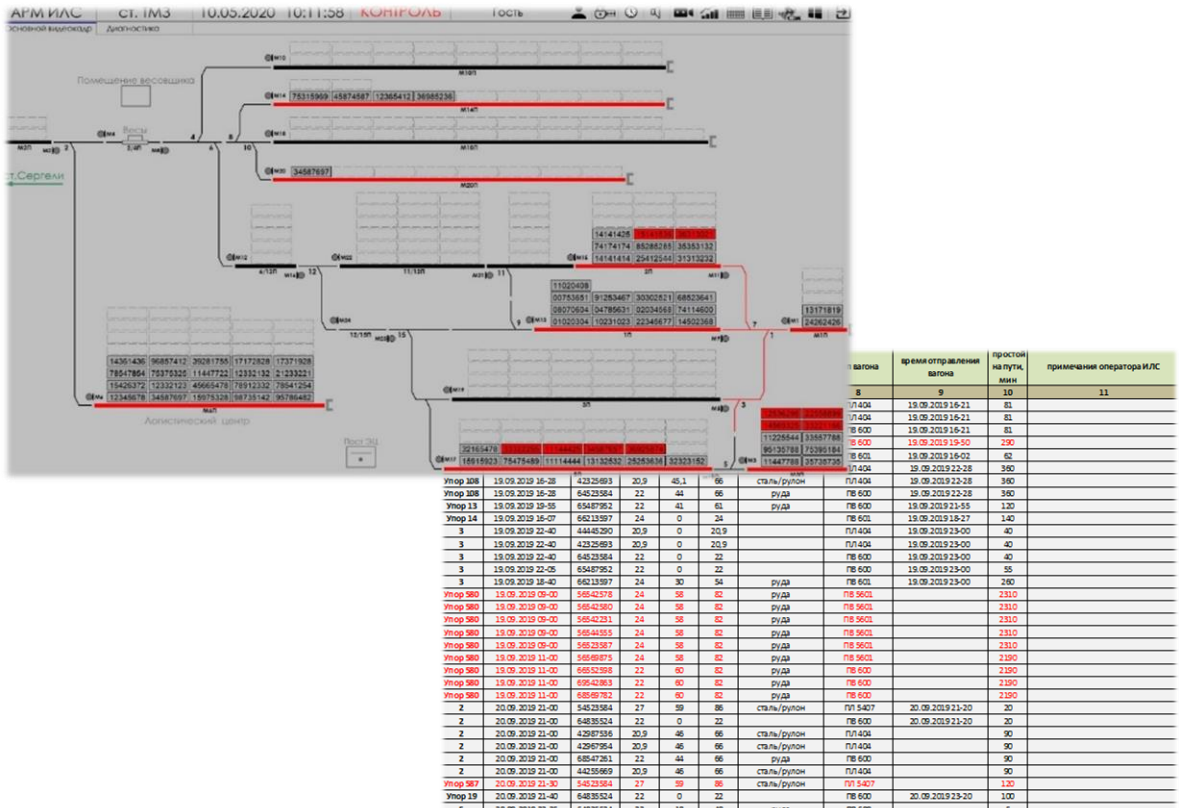
MAINTENANCE ENGINEER WORKSTATION (ARM SHN)



MAINTENANCE ENGINEER WORKSTATION (ARM SHN) main functions:

- ✓ status of station track layouts and train traffic monitoring
- ✓ status of the wayside signaling devices monitoring
- ✓ diagnostics of power supply devices, CBI and ACS monitoring
- ✓ service functions (user access, archive, event log, configuration of ACS devices, change of system time)



CENTRALIZED TRAFFIC CONTROL CTC-SIGNAL
OPERATOR'S WORKSTATION (MONITORING)


The screenshot displays a graphical user interface for a centralized traffic control workstation. The top part shows a schematic diagram of a railway track with various stations and signals. Trains are represented by colored bars with their identification numbers. The bottom part of the screen shows a data table with the following columns: вагон (wagon), время отправления (departure time), время прибытия (arrival time), and примечания оператора ИЛС (operator remarks).

| вагон | время отправления | время прибытия | примечания оператора ИЛС |
|-------|-------------------|----------------|--------------------------|
| 8 | 19.09.2019 16-21 | 81 | |
| 9 | 19.09.2019 16-21 | 81 | |
| 10 | 19.09.2019 16-21 | 81 | |
| 11 | 19.09.2019 16-21 | 81 | |
| 12 | 19.09.2019 16-21 | 81 | |
| 13 | 19.09.2019 16-21 | 81 | |
| 14 | 19.09.2019 16-21 | 81 | |
| 15 | 19.09.2019 16-21 | 81 | |
| 16 | 19.09.2019 16-21 | 81 | |
| 17 | 19.09.2019 16-21 | 81 | |
| 18 | 19.09.2019 16-21 | 81 | |
| 19 | 19.09.2019 16-21 | 81 | |
| 20 | 19.09.2019 16-21 | 81 | |
| 21 | 19.09.2019 16-21 | 81 | |
| 22 | 19.09.2019 16-21 | 81 | |
| 23 | 19.09.2019 16-21 | 81 | |
| 24 | 19.09.2019 16-21 | 81 | |
| 25 | 19.09.2019 16-21 | 81 | |
| 26 | 19.09.2019 16-21 | 81 | |
| 27 | 19.09.2019 16-21 | 81 | |
| 28 | 19.09.2019 16-21 | 81 | |
| 29 | 19.09.2019 16-21 | 81 | |
| 30 | 19.09.2019 16-21 | 81 | |
| 31 | 19.09.2019 16-21 | 81 | |
| 32 | 19.09.2019 16-21 | 81 | |
| 33 | 19.09.2019 16-21 | 81 | |
| 34 | 19.09.2019 16-21 | 81 | |
| 35 | 19.09.2019 16-21 | 81 | |
| 36 | 19.09.2019 16-21 | 81 | |
| 37 | 19.09.2019 16-21 | 81 | |
| 38 | 19.09.2019 16-21 | 81 | |
| 39 | 19.09.2019 16-21 | 81 | |
| 40 | 19.09.2019 16-21 | 81 | |
| 41 | 19.09.2019 16-21 | 81 | |
| 42 | 19.09.2019 16-21 | 81 | |
| 43 | 19.09.2019 16-21 | 81 | |
| 44 | 19.09.2019 16-21 | 81 | |
| 45 | 19.09.2019 16-21 | 81 | |
| 46 | 19.09.2019 16-21 | 81 | |
| 47 | 19.09.2019 16-21 | 81 | |
| 48 | 19.09.2019 16-21 | 81 | |
| 49 | 19.09.2019 16-21 | 81 | |
| 50 | 19.09.2019 16-21 | 81 | |
| 51 | 19.09.2019 16-21 | 81 | |
| 52 | 19.09.2019 16-21 | 81 | |
| 53 | 19.09.2019 16-21 | 81 | |
| 54 | 19.09.2019 16-21 | 81 | |
| 55 | 19.09.2019 16-21 | 81 | |
| 56 | 19.09.2019 16-21 | 81 | |
| 57 | 19.09.2019 16-21 | 81 | |
| 58 | 19.09.2019 16-21 | 81 | |
| 59 | 19.09.2019 16-21 | 81 | |
| 60 | 19.09.2019 16-21 | 81 | |
| 61 | 19.09.2019 16-21 | 81 | |
| 62 | 19.09.2019 16-21 | 81 | |
| 63 | 19.09.2019 16-21 | 81 | |
| 64 | 19.09.2019 16-21 | 81 | |
| 65 | 19.09.2019 16-21 | 81 | |
| 66 | 19.09.2019 16-21 | 81 | |
| 67 | 19.09.2019 16-21 | 81 | |
| 68 | 19.09.2019 16-21 | 81 | |
| 69 | 19.09.2019 16-21 | 81 | |
| 70 | 19.09.2019 16-21 | 81 | |
| 71 | 19.09.2019 16-21 | 81 | |
| 72 | 19.09.2019 16-21 | 81 | |
| 73 | 19.09.2019 16-21 | 81 | |
| 74 | 19.09.2019 16-21 | 81 | |
| 75 | 19.09.2019 16-21 | 81 | |
| 76 | 19.09.2019 16-21 | 81 | |
| 77 | 19.09.2019 16-21 | 81 | |
| 78 | 19.09.2019 16-21 | 81 | |
| 79 | 19.09.2019 16-21 | 81 | |
| 80 | 19.09.2019 16-21 | 81 | |
| 81 | 19.09.2019 16-21 | 81 | |
| 82 | 19.09.2019 16-21 | 81 | |
| 83 | 19.09.2019 16-21 | 81 | |
| 84 | 19.09.2019 16-21 | 81 | |
| 85 | 19.09.2019 16-21 | 81 | |
| 86 | 19.09.2019 16-21 | 81 | |
| 87 | 19.09.2019 16-21 | 81 | |
| 88 | 19.09.2019 16-21 | 81 | |
| 89 | 19.09.2019 16-21 | 81 | |
| 90 | 19.09.2019 16-21 | 81 | |
| 91 | 19.09.2019 16-21 | 81 | |
| 92 | 19.09.2019 16-21 | 81 | |
| 93 | 19.09.2019 16-21 | 81 | |
| 94 | 19.09.2019 16-21 | 81 | |
| 95 | 19.09.2019 16-21 | 81 | |
| 96 | 19.09.2019 16-21 | 81 | |
| 97 | 19.09.2019 16-21 | 81 | |
| 98 | 19.09.2019 16-21 | 81 | |
| 99 | 19.09.2019 16-21 | 81 | |
| 100 | 19.09.2019 16-21 | 81 | |

OPERATOR'S WORKSTATION (MONITORING) Main functions:

- ✓ visual operational control of the location of trains (schematic diagram)
- ✓ display of information about numbers and weight of wagons
- ✓ track filling monitoring
- ✓ wagons downtime control
- ✓ traffic analytics and reference information
- ✓ archive

