Advant Controller 31

Intelligent Decentralized
Automation System

Example program for 907 AC 1131
ARCNET communication (AINIT_V)

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ABB STOTZ KONTAKT

1. Which components are required?

Hardware components:

- 2 x basic unit (07 KT 96, **07 KT 97**, 07 KT 98)
- 1 x power supply unit 24 V DC (e.g. **07 NG 34**)
- 1 x programming cable for the basic unit (**07 SK 90**)
- 1 x ARCNET cable incl. two terminating resistors

Software:

- 1 x programming software for the basic unit 907 AC 1131
- 1 x example program for basic unit (BSP_ARCNETV_MASTER_N1) and
  1 x example program for basic unit (BSP_ARCNETV_SLAVE_N2)

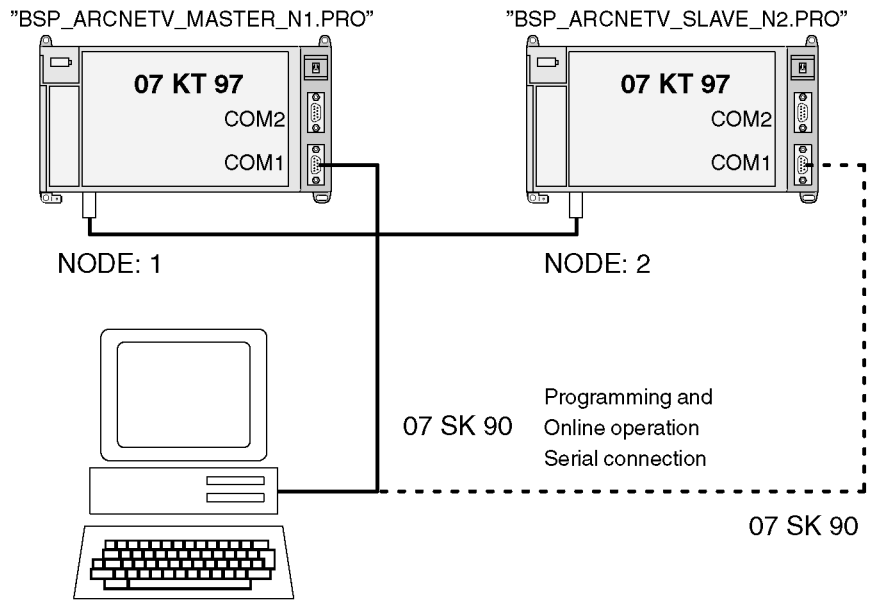
Miscellaneous equipment for programming:

- 1 x PC (see 907 AC 1131 part 2, programming and block library, installation)
- 1 x documentation: - 907 AC 1131 part 1 (hardware and system technology)
  - 907 AC 1131 part 2 (programming and libraries)

In the following description you will find several references to the documentation.

2. Configuration

The ARCNET ring consists of two basic units. The first basic unit has station address 1 (Node 1) and processes example program "BSP_ARCNETV_MASTER_N1.PRO". This basic unit is used to restart the sending and receiving of the telegrams after a communication failure has occurred. The second basic unit has station address 2 (Node 2) and processes example program "BSP_ARCNETV_SLAVE_N2.PRO". This basic unit receives the data packages from the master and returns the same package.



Configuration ARCNET (AINIT_V)

3. Short description for commissioning

1. Set the ARCNET addresses (Node 1 and Node 2) at the basic units.

2. Supply the basic units with 24 V DC (power supply unit) and turn them on.

3. Establish the ARCNET cable connection between the basic units.

4. Connect the programming cable 07 SK 90 to the basic unit (COM 1) and the PC.

5. Copy and start the example programs "BSP_ARCNETV_MASTER_N1.PRO" and "BSP_ARCNETV_SLAVE_N2.PRO" using the programming software 907 AC 1131.

6. Test the program.

4. The following steps have to be carried out

4.1. Setting the ARCNET addresses at the basic units

First, the ARCNET addresses (NODE numbers) have to be set at the basic units.
Basic unit 1: Basic unit 1 is identified as NODE number 1. For this, set DIL switch 8 to ON; all other switches remain in the OFF position.
Basic unit 2: Basic unit 2 is identified as NODE number 2. For this, set DIL switch 7 to ON; all other switches remain in the OFF position.

4.2. Supplying the basic unit with 24 V DC (power supply unit) and switching it on

Now the devices have to be supplied by 24 V DC.
At the basic units 0 V has to be connected to terminal (M) and 24 V DC to terminal (L+). (See documentation 907 AC 1131 part 1, basic units, connection of supply voltage.)

4.3. Establishing the ARCNET cable connection between the basic units

Please use a coaxial cable with a characteristic impedance of 93Ω. At both cable ends a terminating resistor of 93Ω has to be installed (refer to documentation 907 AC 1131 part 1, ARCNET descriptions). Connect this cable to the corresponding connectors.

4.4. Connecting the programming cable to the basic unit and the PC

The programming cable 07 SK 90 connects the PLC to the PC. The 9-pole plug of this cable has to be connected to COM1 of the 07 KT 9x. The other cable end has to be connected to the PC's serial interface (e.g. COM1). Start with connecting basic unit 1 (Node 1) to the PC (see documentation 907 AC 1131 part 1, serial interface cable 07 SK 90).

4.5. Copying and starting the example program for the basic units

Before copying the example program you have to make sure that the basic units are supplied with voltage, that the programming cable is connected and that the PC is running.
Program "*BSP_ARCNETV_MASTER_N1*" has to be downloaded to PLC 1 (Node 1) and program "*BSP_ARCNETV_SLAVE_N2*" to PLC 2 (NODE 2). The following description starts with PLC 1.
First, start the 907 AC 1131 programming software on the PC. Then, continue as follows:

- Start the example program "*BSP_ARCNET_NODE1*" by selecting the menu item <*File*> <*Open*>.
- Prior to sending the example program to the basic unit, it has to be compiled. For that purpose press <*F11*>.
- Now the communication parameters have to be installed. Using the menu item <*Online*> <*Communication parameters*> the corresponding interface parameters can be set. In our example the driver ABB RS232 was installed on *COM1* (*19200 baud, no parity, 1 stop bit*).
- In the menu <*Online*> <*Login*> you have to activate the sending process. Confirm the information about the existing program stored on the PLC with *OK*.
- Now you are asked "The program was changed! Do you want to load the new program?". Answer this question with *Yes* to load the entire program.
- Finally, start the program by pressing <*F5*>.
  The program is running.
- Then connect the programming cable to the COM 1 interface of the second PLC (Node 2). Repeat all steps and load the example program "*BSP_ARCNETV_SLAVE_N2*" to the second PLC.

(See documentation 907 AC 1131 part 2, software description, project management and general online functions.)

5. Functional description

The example program shows an ARCNET communication between an ARCNET master with the address 1 (Node 1) and an ARCNET slave with the address 2 (Node 2).
The programs are divided into two parts: the main program "PLC_PRG", in which the actual communication is implemented, and the subroutine "Write_outputs", which routes certain messages to the basic unit outputs for indication purposes.

5.1. BSP_ARCNETV_MASTER_N1

This program contains the communication via ARCNET of ARCNET station Node 1. In case of a communication failure this program has to re-establish the communication with ARCNET station Node 2.
The AINIT_V block initializes the ARCNET controller. The AREC_V block receives all incoming telegrams. Using a telegram counter it is checked, whether Node 2 has answered. In that case, the counter is incremented by one. Via the ASEND_V block a telegram containing the job number 11 and the telegram counter is sent to ARCNET station Node 2. The telegram counter received by Node 2 is written to the outputs A62_08..A62_15 for signaling purposes. During running operation you can see the received counter. If no new telegram is received the counter stops. If this state is held for a minimum of 10 seconds, the telegram counter is deleted. If the connection is established again, the communication between Node 1 and Node 2 starts automatically after a short time. The automatic establishment of the connection is performed via the release conditions of ASEND_V because the exchange of telegrams must be initiated by a subscriber. At output A63_00 it is signalized by steady light, whether the initialization of the ARCNET controller was successful. At output A63_01 it is signalized by flashing light, that the communication is disturbed (e.g. since the ARCNET cable is not connected anymore).

5.2. BSP_ARCNETV_SLAVE_N2

This program contains the communication via ARCNET of ARCNET station Node 2.
The AINIT_V block initializes the ARCNET controller. The AREC_V block receives all incoming telegrams. By comparing the telegram counter it is analyzed, whether Node 1 has sent a new telegram. This value is sent back unchanged. Via the ASEND_V block a telegram containing the job number 10 and the telegram counter is sent to ARCNET station Node 1. The telegram counter received by Node 1 is written to the outputs A62_00..A62_07 for signaling purposes. During running operation you can see the received counter. If no new telegram is received the counter stops. If this state is held for a minimum of 10 seconds, the telegram counter is deleted. If the connection is established again, the communication between Node 1 and Node 2 starts automatically after a short time. The communication is initiated by Node 1. At output A63_00 it is signalized by steady light, whether the initialization of the ARCNET controller was successful. At output A63_01 it is signalized by flashing light, that the communication is disturbed (e.g. since the ARCNET cable is not connected anymore).