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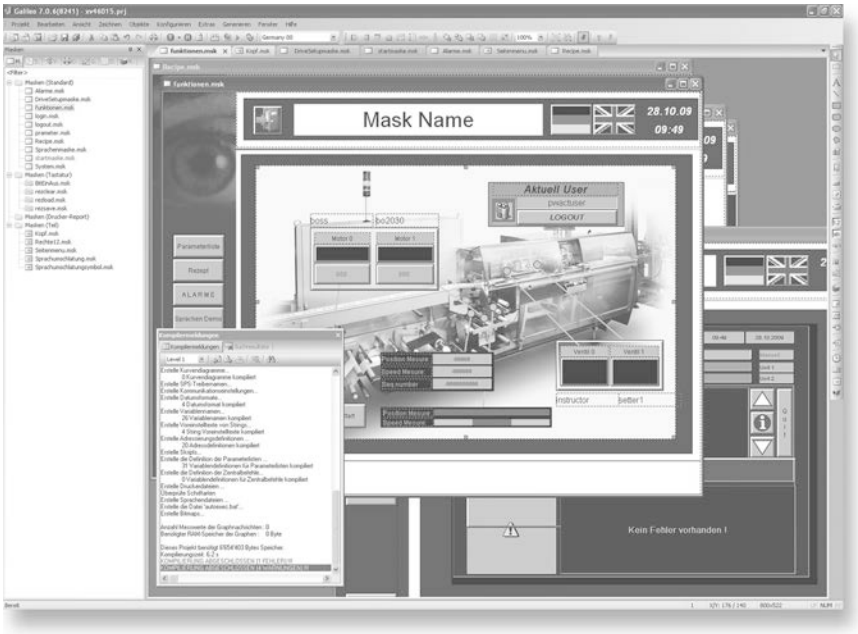
User manual

Communication
Allen Bradley SLC / MicroLogix



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Original instructions
The German version of this document is the original instructions

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1 General

1.1 Aim and purpose of this document

This user manual contains information required for connecting the automation components of Eaton Automation to SLC and MicroLogix from Allen Bradley.

This user manual describes the installation and configuration. The operating system and application software are not described.

1.2 Comments about this user manual

Please send any comments, recommendations or suggestions relating to this user manual to automation@eaton.com.

1.3 Additional documentation

Further documents may be helpful in addition to this user manual.

The following documentation can be obtained from our website (www.eaton-automation.com):

[1] MN05010007Z
System Description Windows CE

2 Communication overview

2.1 Serial communication operating principle

The communication uses the DF1 protocol via the RS232 interface. Communication is implemented from a panel or a PC with exactly one «Controller» per RS232.

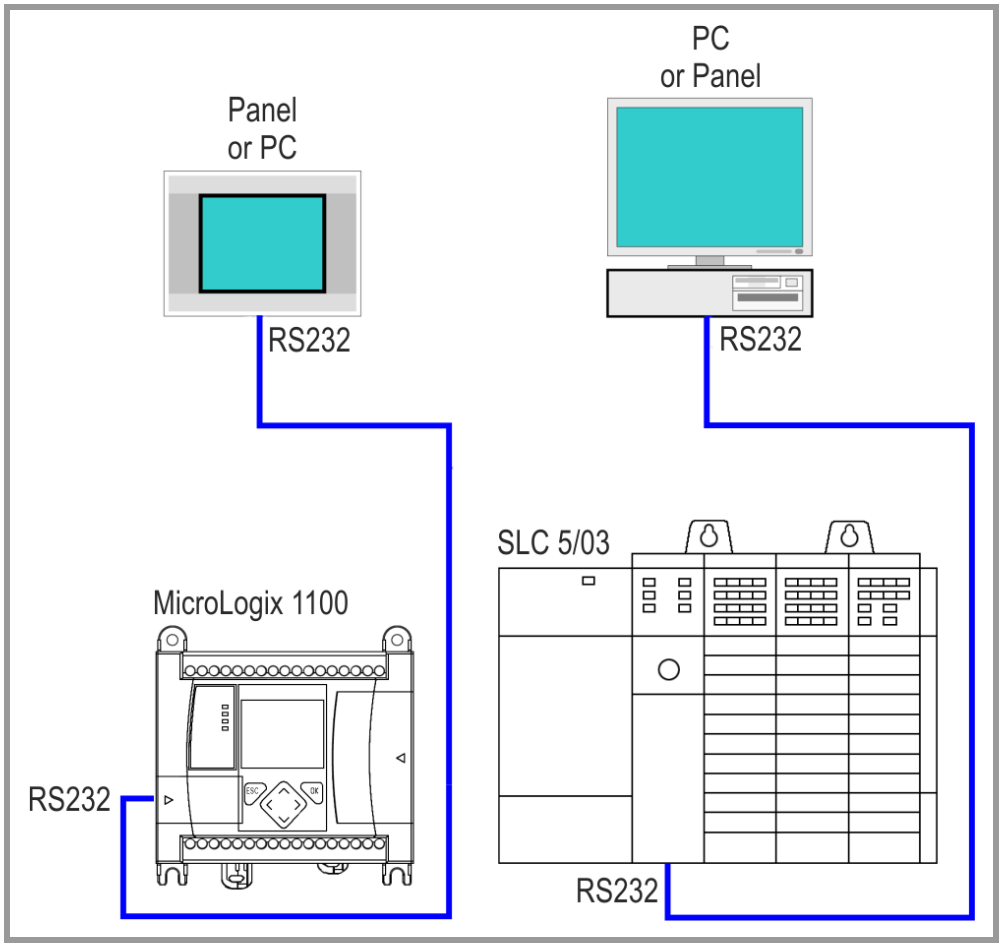


Fig. 1 Serial communication operating principle

2.2 Ethernet communication operating principle

The communication uses the DF1 protocol via the Ethernet interface. Communication is implemented from a panel or a PC with exactly one «Controller» per Ethernet.

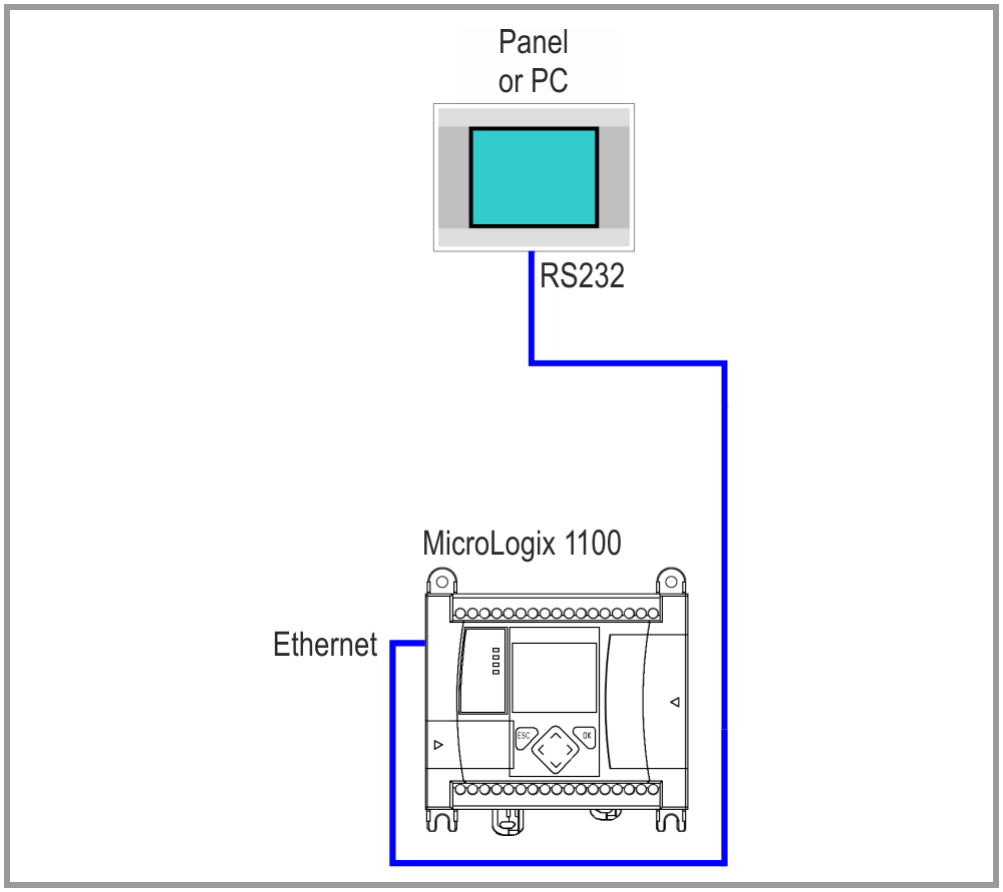


Fig. 2 Ethernet communication operating principle

2.3 Supported systems

2.3.1 Client

The following devices are suitable for communication with Allen Bradley SLC / MicroLogix:

- PC with GALILEO Open and RS232 interface
- MICRO PANEL XV Series with RS232 interface
- MICRO PANEL M Series with RS232 interface

The term «Client» in the following documentation stands for these devices and the software running on them.

2.3.2 Server

The following «Controllers» are supported:

- SLC 5/03 (RS232 interface)
- SLC 5/04 (RS232 interface)
- SLC 5/05 (RS232 interface)
- MicroLogix (RS232 interface and Ethernet interface)

The term «Controller» in the following documentation stands for these devices.

2.4 Communication parameters (serial communication)

The baud rate settings for «Client» and «Controller» must be identical.

The «Client» uses node address 0.

Configure the DF1 interface of the «Controller»:

- Node address: 1
- System Mode
- DF1 Full Duplex
- 8 Data Bits, Even Parity, 1 Stop Bit
- No Handshaking
- BCC or CRC Error Detection
- 1000 ms ACK Timeout
- 3 NAK Retries
- 3 ENQ Retries

2.5 Supported data

2.5.1 Addresses

Description	Address range
B-File	B0:0 ... B255:255
N-File	N0:0 ... N255:255
F-File	F0:0 ... F255:255

Tab. 1 Supported addresses

In addition to the files listed above, there are also supported timer and counter queries for the Ethernet communication.

The available address ranges are:

Description	Address range
T-File	T0:0 ... T255:255
C-File	C0:0 ... C255:255

Tab. 2 Supported addresses

2.5.2 Timer

The Timer consists of three Word Datablocks.

Word	Bit			
	0 ... 12	13	14	15
0	Internal use only	DN	TT	EN
1	Preset value			
2	Accumulated value			

Tab. 3 DN = Timer Date Bit
TT = Timer Timing Bit
EN = Timer Enable Bit

To access the entire data block on the HMI, it is necessary to make a Word Array with 3 elements.

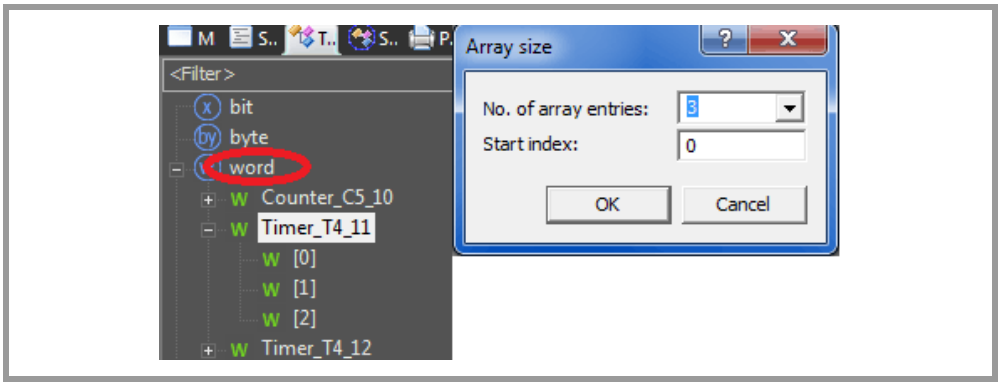


Fig. 3 Timer Array

The start address of the data block is specified as usual.

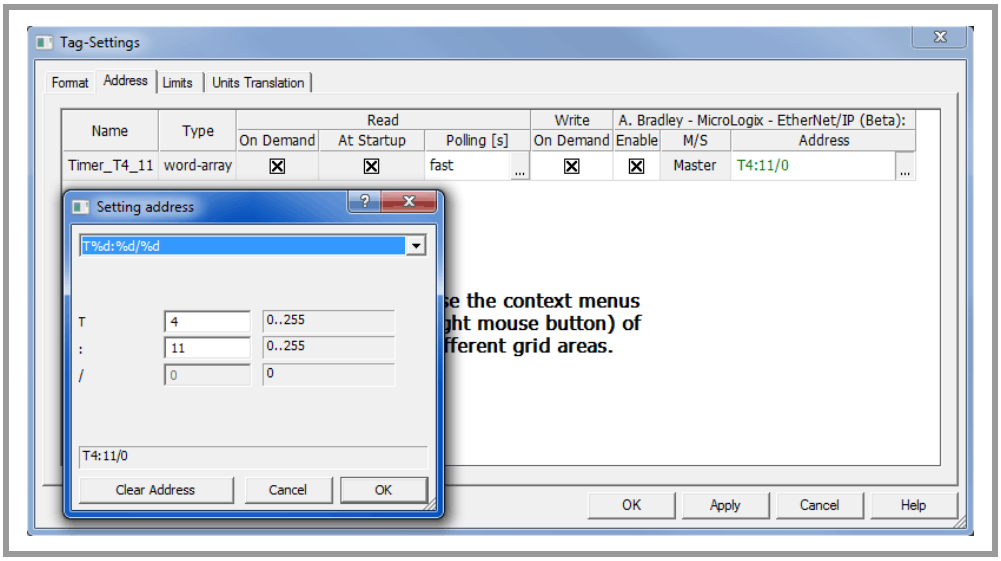


Fig. 4 Setting address

2.5.3 Counter

The Counter consists of three Word Datablocks.

Word	Bit					
	0 ... 8	11	12	13	14	15
0	Not used	UN	OV	DN	CD	CU
1	Preset value					
2	Accumulated value					

Tab. 4 UN = Count Underflow Bit
OV = Count Overflow Bit
DN = Count Done Bit
CD = Count Down Enable Bit
CU = Count Up Enable Bit

Perform the same steps as described under 2.4.2 Timer, to create Counter tags.

3 Hardware

Both «Client» and also «Controller» are provided with an RS232 interface via which they can be connected. With the MicroLogix Controller there is also the possibility of a connection via Ethernet. Information on mounting, wiring and commissioning is provided in the operating instructions of the respective devices.

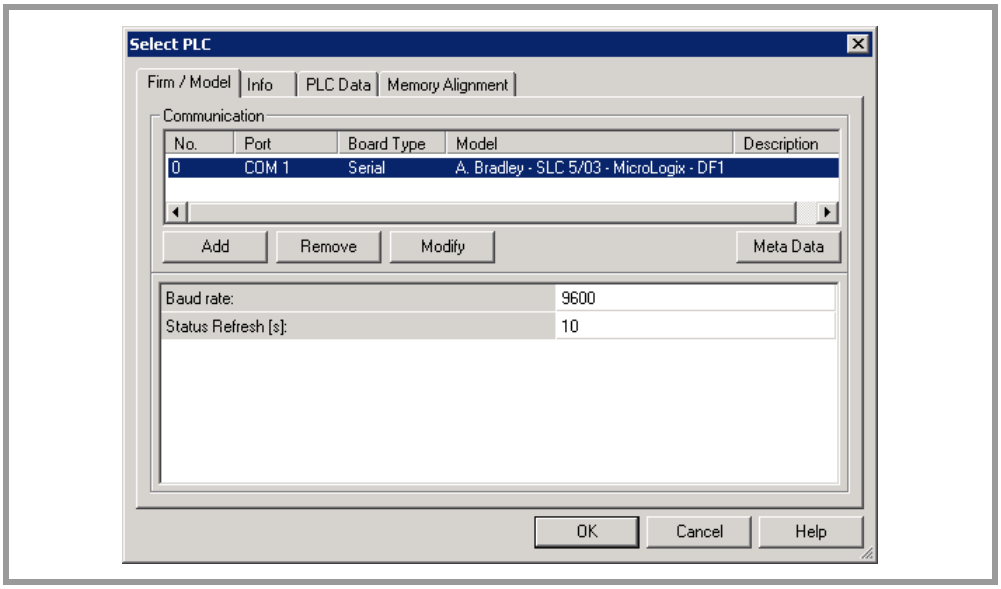
4 Software

4.1 GALILEO

The GALILEO visualization software supports several parallel communication channels. A «Controller» is assigned one serial interface exclusively. However, it is possible to configure several communication channels to the same «Controller» (the same serial interface).

4.1.1 Configuring communication in GALILEO – serial interface

Choose «A. Bradley – SLC 5/03 – MicroLogix – DF1» and set the communication parameters.



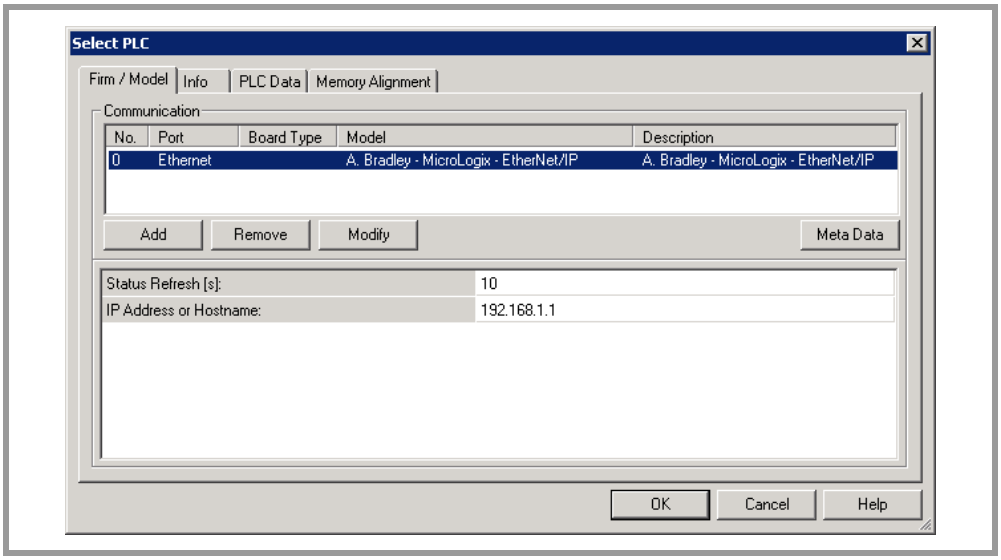
1) Configuring communication in GALILEO

Communication parameter	Comment
Baud rate	The baud rate settings for «Client» and «Controller» must be identical.
Status Refresh	Read the Online Help of your GALILEO version.

Tab. 5 Communication parameters

4.1.2 Configuring communication in GALILEO – Ethernet interface

Choose «A. Bradley – MicroLogix – EtherNet/IP» and set the communication parameters.



2) Configuring communication in GALILEO – Ethernet interface

Communication parameter	Comment
IP Address or Hostname	IP Address or Hostname Example: 192.168.1.1

Tab. 6 Communication parameters

4.1.3 Addressing variables in GALILEO

The chapter 2.5 describes which variables of the «Controllers» you can access. GALILEO supports the following address forms and data types:

GALILEO	Controller
B%d:%d N%d:%d F%d:%d	Variables on the controller.

Tab. 7 Address forms in GALILEO

GALILEO	Controller
Bit / Error	B, N
Byte	B, N
Word	B, N
dword	not supported
Float	F
String	not supported
Structure	B, N
System	B, N

Tab. 8 Data types in GALILEO

4.2 THC

A THC component (THC = Tag Handle Container) is used on the «Client» for the communication to the server. As a GALILEO user, you do not have anything to do directly with the THC component. However, you need the following information when using, for example, the ThcSymbolicClient library in XSoft-CoDeSys or MXpro.

4.2.1 Configuration

Configuration parameter	Value
Component	MicroPanel.AB.SLC.dll
ProgId	MicroInnovation. AB.SLC.TagServer

Tab. 9 THC configuration parameter

Communication parameter	Data type	Comment
LocalSerialPort	String	Serial interface used by the client e.g. COM1
BaudRate	Unsigned32	Baud rate of the serial interface of the client e.g. 19200

Tab. 10 THC communication parameter

5 Error messages

3) Error message

5.1 Local STS Error Codes

The local STS error code nibble contains errors found by the local node. Error codes (in hex) that you may find in the local error code nibble include.

Code	Explanation
00	Success – no error
01	DST node is out of buffer space
02	Cannot guarantee delivery: link layer (The remote node specified does not ACK command.)
03	Duplicate token holder detected
04	Local port is disconnected
05	Application layer timed out waiting for a response
06	Duplicate not detected
07	Station is offline
08	Hardware fault

Tab. 11 Local STS Error Codes

Local STS codes 09 through 0F (hex) are not used.

5.2 Remote STS Error Codes

The remote STS error code nibble contains errors found by the remote node receiving the command. Error codes (in hex) that you may find in the remote error code nibble of the STS byte include.

Code	Explanation
00	Success – no error
10	Illegal command or format
20	Host has a problem and will not communicate
30	Remote node host is missing, disconnected or shut down
40	Host could not complete function due to hardware fault
50	Addressing problem or memory protect rungs
60	Function not allowed due to command protection selection
70	Processor is in Program mode
80	Compatibility mode file missing or communication zone problem
90	Remote node cannot buffer command
A0	Wait ACK (1775-KA buffer full)
B0	Remote node problem due to download
C0	Wait ACK (1775-KA buffer full)
D0	Not used
E0	Not used
F0	Error code in the EXT STS byte (see Tab. 13)

Tab. 12 Remote STS Error Codes

5.2.1 EXT STS byte

You have an EXT STS byte if your STS code is F0 (hex).

EXT STS Codes for CMD of

Hex Code	Explanation
0	Not used
1	A file has an illegal value
2	Less levels specified in address than minimum for any address
3	More levels specified in address than system supports
4	Symbol not found
5	Symbol is of improper format
6	Address doesn't point to something usable
7	File is wrong size
8	Cannot complete request, situation has changed since the start of the command
9	Data or file is too large
A	Transaction size plus word address is too large
B	Access denied, improper privilege
C	Condition cannot be generated – resource is not available
D	Condition already exists – resource is already available
E	Command cannot be executed
F	Histogram overflow
10	No access
11	Illegal data type
12	Invalid parameter or invalid data
13	Address reference exists to deleted area
14	Command execution failure for unknown reason; possible PLC-3 histogram overflow
15	Data conversion error
16	Scanner not able to communicate with 1771 rack adapter
17	Type mismatch
18	1771 module response was not valid
19	Duplicated label
22	*Remote rack fault
23	*Timeout

24	*Unknown error
1A	File is open; another node owns it
1B	Another node is the program owner
1C	Reserved
1D	Reserved
1E	Data table element protection violation
1F	Temporary internal problem

Tab. 13 Remote STS Error Codes

*These codes are for passthru from a DH+ link to a remote I/O link.