

Terminal LFC (IEC 870-5)

Terminal LFC (IEC 870-5) communication protocol

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Supported device types and versions

This communication supports data reading and writing by IEC870-5-101 communication protocol with special modifications. TCP/IP UDP network communication or a serial communication on Serial or SerialOverUDP Device Redundant communication line can be used.

An implementation according to IEC870-5-101 standard:

- **Originator ASDU address** - omitted.
- **ASDU address** - it is 1 byte and represents a station address. A different ASDU address of each station on the same line is required.
- **Cause of transmission** - it is 1 byte (it does not contain Originator ASDU address).
- **Information object address** - 2 bytes, it represents I/O tag address.

Communication line configuration

- Communication line category: [Serial](#), [TCP/IP-UDP](#), [SerialOverUDP Device Redundant](#)
- UDP Parameters:
 - The parameters of primary server or secondary one are required.
 - Host: string max. 80 characters – a server name in the INET form (the name or numerical address a.b.c.d).
 - Port: UDP port number (1 to 65535).

Communication line protocol parameters

[Configuration line](#) dialog box - tab **Protocol parameters**.

They influences some of the optional protocol parameters. The following line parameters can be set:

Table 1

Parameter	Meaning	Unit	Default value
Link Address	Communication line address (1 byte).	-	1
Communication Error Timeout	Timeout defined for the check of communication on the line (or on the lines of primary or backup communication in case of UDP communication). If communication does not work longer than it is this value, the values of all communication stations on the line will be transferred to StCOMERR state.	ms	10 sec

Communication station configuration

- Communication protocol: **Terminal LFC (IEC870-5)**.
- Station address is a decimal number ranging from 0 up to 255. It represents the *ASDU address* in the protocol.

Communication station parameters

[Configuration station](#) dialog box - tab **Protocol parameters**.

They influences some of the optional protocol parameters. The following station parameters can be set:

Table 2

Parameter	Meaning	Unit	Default value
Retry Count	Number of the call retry when some communication error occurs.	-	2
Retry Timeout	A delay between the call retries when some communication error occurs.	ms	100 ms

Wait First Timeout	Time of the first waiting for response after the call has been sent.	ms	100 ms
Wait Timeout	A delay between reading of the response till its completing.	ms	500 ms
Max. Wait Retry	Number of retry of response reading till its completing.	-	6
No Data Timeout	A delay after the response without data has come (Positive Quittung).	ms	300 ms
Analog Constant	A constant to calculate an address of a measurement.	-	129
Analog Offset	A constant to calculate an address of a measurement.	-	40000
Digital Constant	A constant to calculate an address of the signals.	-	501
Counter Constant	A constant to calculate an address of the signals.	-	1026
Counter Offset	A constant to calculate an address of the counters.	-	60000
DataClass Req. Compatibility	A compatibility of <i>data class 1</i> and <i>class 2</i> requests according to IEC870-5-101 specification. A value NO means that only <i>data class 1</i> are called.	YES /NO	NO
Send PostMortemData	Permission to send a received data with a timestamp as so-called post-mortem data (only to an archive).	YES /NO	YES

I/O tag configuration

A possible I/O tags: **Ai, Ao, Ci, Di, Dout, Qi**

The address consists of two parameters - **Object** and **Value**.

These parameter are used to calculate the address (in the range 0 to 65535) according to these formulas:

- The calculation of complete address for **Ai, Ao** tags (the measurements):

$$\text{Address} = ((\text{Object} - 1) * \text{ACONST}) + \text{Value} + \text{AOFFSET}$$

- The calculation of complete address for **Di, Dout** tags (the signals):

$$\text{Address} = ((\text{Object} - 1) * \text{DCONST}) + \text{Value}$$

- The calculation of complete address for **Ci** tag (the counters):

$$\text{Address} = ((\text{Object} - 1) * \text{CCONST}) + \text{Value} + \text{COFFSET}$$

As regards **Dout** tags, you can set **Value address** (i.e. **Object** and **Value**). A basic address data is required at writing. **Value address** is used to update I/O tag value at reading.

Specific differences between IEC870-5 and IEC870-5-101 protocols

The differences between IEC870-5 and [IEC870-5-101](#) protocols:

- An alternate highest bit RES of Control Field is used which signalized data receiving from an active server (RES=0). Otherwise, data are ignored (RES=1).
- An arrival of the binary value TRUE to the object with address 65007 (so-called USAN bit) signalized a transition of I/O tag values of all stations to the value with "Weak" flag, i.e. all values become invalid.

Literature

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Changes and modifications

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Document revisions

- Ver. 1.0 – February 9th, 2000.
- Ver. 1.1 – July 11th, 2003 - scan mode.
- Ver. 1.2 - January 25th, 2011 - document update.



Related pages:

[Communication protocols](#)