

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.

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 influence 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)**.
- The 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 influence some of the optional protocol parameters. The following station parameters can be set:

Table 2

Parameter	Meaning	Unit	Default value
Retry Count	Maximum count of request retries. If no response returns after a request had been sent, the station's status will change to a communication error.	-	2

Retry Timeout	Timeout before resending a request if no response has been received.	ms	100 ms
Wait First Timeout	The delay after sending the request and before reading the response.	ms	100 ms
Wait Timeout	The delay between the response readings.	ms	500 ms
Max. Wait Retry	The maximum number of retries of the response reading.	-	6
No Data Timeout	A delay after the response without any data has come (Positive Confirmation).	ms	300 ms
Analog Constant	A constant to calculate addresses of measurements.	-	129
Analog Offset	A constant to calculate addresses of measurements.	-	40000
Digital Constant	A constant to calculate addresses of the signals.	-	501
Counter Constant	A constant to calculate addresses of the signals.	-	1026
Counter Offset	A constant to calculate addresses of the counters.	-	60000
DataClass Req. Compatibility	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>class 1 data</i> " are requested.	YES /NO	NO
Send PostMortemData	Permission to send the 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 parameters 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 (measurements):

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

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

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

- The calculation of complete address for **Ci** tag (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**). Basic address data is required in 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 to signalize data receiving from an active server (RES=0) in a redundant system. Otherwise, data come from a passive server and they are ignored (RES=1).
- The 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](#)