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IEC 60870-5-103
Interoperability Document for:
StreamBridge: Stream870-5-103

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1. Interoperability

This companion standard presents sets of parameters and alternatives from which subsets have to be selected to implement particular telecontrol systems. Certain parameter values, such as the number of octets in the COMMON ADDRESS of ASDUs represent mutually exclusive alternatives. This means that only one value of the defined parameters is admitted per system.

Other parameters, such as the listed set of different process information in command and in monitor direction allow the specification of the complete set or subsets, as appropriate for given applications. This clause summarizes the parameters of the previous clauses to facilitate a suitable selection for a specific application. If a system is composed of equipment stemming from different manufacturers it is necessary that all partners agree on the selected parameters.

NOTE: In addition, the full specification of a system may require individual selection of certain parameters for certain parts of the system, such as the individual selection of scaling factors for individually addressable measured values. The selected parameters should be marked in the white boxes as follows:

- Implemented + tested
- Implemented + not tested
- Not implemented

1.1 Physical Layer

1.1.1 Electrical Interface

- EIA RS-485
- Number of loads 32. For one protection equipment

NOTE - EIA RS-485 standard defines unit loads so that 32 of them can be operated on one line. For detailed information refer to clause 3 of EIA RS-485 standard.

1.1.2 Optical Interface

- Glass fiber
- Plastic fiber
- F-SMA type connector
- BFOC/2,5 type connector

1.1.3 Transmission speed

- 9 600 bit/s
- 19 200 bit/s

1.2 Link Layer

There are no choices for the link layer.

1.3 Application Layer

1.3.1 Transmission mode for application data

Mode 1 (least significant octet first), as defined in 4.10 of IEC 60870-5-4, is used exclusively in this companion standard.

1.3.2 Common address of ASDU

- One COMMON ADDRESS of ASDU (identical with station address)
- More than one COMMON ADDRESS of ASDU

1.3.3 Selection of standard information numbers in monitor direction

1.3.3.1 System functions in monitor direction

	INF	Semantics
<input checked="" type="checkbox"/>	<0>	End of general interrogation
<input checked="" type="checkbox"/>	<0>	Time synchronization
<input checked="" type="checkbox"/>	<2>	Reset FCB
<input checked="" type="checkbox"/>	<3>	Reset CU
<input checked="" type="checkbox"/>	<4>	Start/restart
<input checked="" type="checkbox"/>	<5>	Power on

1.3.3.2 Status indications in monitor direction

	INF	Semantics
<input checked="" type="checkbox"/>	<16>	Auto-recloser active
<input checked="" type="checkbox"/>	<17>	Teleprotection active
<input checked="" type="checkbox"/>	<18>	Protection active
<input checked="" type="checkbox"/>	<19>	LED reset
<input checked="" type="checkbox"/>	<20>	Monitor direction blocked
<input checked="" type="checkbox"/>	<21>	Test mode
<input checked="" type="checkbox"/>	<22>	Local parameter setting
<input checked="" type="checkbox"/>	<23>	Characteristic 1
<input checked="" type="checkbox"/>	<24>	Characteristic 2
<input checked="" type="checkbox"/>	<25>	Characteristic 3
<input checked="" type="checkbox"/>	<26>	Characteristic 4
<input checked="" type="checkbox"/>	<27>	Auxiliary input 1
<input checked="" type="checkbox"/>	<28>	Auxiliary input 2
<input checked="" type="checkbox"/>	<29>	Auxiliary input 3
<input checked="" type="checkbox"/>	<30>	Auxiliary input 4

1.3.3.3 Supervision indications in monitor direction

	INF	Semantics
<input checked="" type="checkbox"/>	<32>	Measurand supervision I
<input checked="" type="checkbox"/>	<33>	Measurand supervision V
<input checked="" type="checkbox"/>	<35>	Phase sequence supervision
<input checked="" type="checkbox"/>	<36>	Trip circuit supervision
<input checked="" type="checkbox"/>	<37>	I>> back-up operation
<input checked="" type="checkbox"/>	<38>	VT fuse failure
<input checked="" type="checkbox"/>	<39>	Teleprotection disturbed
<input checked="" type="checkbox"/>	<46>	Group warning
<input checked="" type="checkbox"/>	<47>	Group alarm

1.3.3.4 Earth fault indications in monitor direction

	INF	Semantics
<input checked="" type="checkbox"/>	<48>	Earth fault L1
<input checked="" type="checkbox"/>	<49>	Earth fault L2
<input checked="" type="checkbox"/>	<50>	Earth fault L3
<input checked="" type="checkbox"/>	<51>	Earth fault forward, i.e. line
<input checked="" type="checkbox"/>	<52>	Earth fault reverse, i.e. busbar

1.3.3.5 Fault indications in monitor direction

	INF	Semantics
<input checked="" type="checkbox"/>	<64>	Start /pick-up L1
<input checked="" type="checkbox"/>	<65>	Start /pick-up L2
<input checked="" type="checkbox"/>	<66>	Start /pick-up L3
<input checked="" type="checkbox"/>	<67>	Start /pick-up N
<input checked="" type="checkbox"/>	<68>	General trip
<input checked="" type="checkbox"/>	<69>	Trip L1
<input checked="" type="checkbox"/>	<70>	Trip L2
<input checked="" type="checkbox"/>	<71>	Trip L3
<input checked="" type="checkbox"/>	<72>	Trip I>> (back-up operation)
<input checked="" type="checkbox"/>	<73>	Fault location X in ohms
<input checked="" type="checkbox"/>	<74>	Fault forward/line
<input checked="" type="checkbox"/>	<75>	Fault reverse/busbar
<input checked="" type="checkbox"/>	<76>	Teleprotection signal transmitted
<input checked="" type="checkbox"/>	<77>	Teleprotection signal received
<input checked="" type="checkbox"/>	<78>	Zone 1
<input checked="" type="checkbox"/>	<79>	Zone 2
<input checked="" type="checkbox"/>	<80>	Zone 3
<input checked="" type="checkbox"/>	<81>	Zone 4
<input checked="" type="checkbox"/>	<82>	Zone 5
<input checked="" type="checkbox"/>	<83>	Zone 6
<input checked="" type="checkbox"/>	<84>	General start/pick-up
<input checked="" type="checkbox"/>	<85>	Breaker failure
<input checked="" type="checkbox"/>	<86>	Trip measuring system L1
<input checked="" type="checkbox"/>	<87>	Trip measuring system L2
<input checked="" type="checkbox"/>	<88>	Trip measuring system L3
<input checked="" type="checkbox"/>	<89>	Trip measuring system E
<input checked="" type="checkbox"/>	<90>	Trip I>
<input checked="" type="checkbox"/>	<91>	Trip I>>
<input checked="" type="checkbox"/>	<92>	Trip IN>
<input checked="" type="checkbox"/>	<93>	Trip IN>>

1.3.3.6 Auto-reclosure indications in monitor direction

	INF	Semantics
<input checked="" type="checkbox"/>	<128>	CB 'on' by AR
<input checked="" type="checkbox"/>	<129>	CB 'on' by long-time AR
<input checked="" type="checkbox"/>	<130>	AR blocked

1.3.3.7 Measurands in monitor direction

	INF	Semantics
<input checked="" type="checkbox"/>	<144>	Measurand I
<input checked="" type="checkbox"/>	<145>	Measurands I, V
<input checked="" type="checkbox"/>	<146>	Measurands I, V, P, Q
<input checked="" type="checkbox"/>	<147>	Measurands IN, VEN
<input checked="" type="checkbox"/>	<148>	Measurands IL1,2,3, V L1,2,3, P, Q, f

1.3.3.8 Generic functions in monitor direction

INF Semantics

- <240> Read headings of all defined groups
- <241> Read values or attributes of all entries of one group
- <243> Read directory of a single entry
- <244> Read value or attribute of a single entry
- <245> End of general interrogation of generic data
- <249> Write entry with confirmation
- <250> Write entry with execution
- <251> Write entry aborted

1.3.4 Selection of standard information numbers in control direction

1.3.4.1 System functions in control direction

INF Semantics

- <0> Initiation of general interrogation
- <0> Time synchronization

1.3.5 General commands in control direction

INF Semantics

- <16> Auto-recloser on/off
- <17> Teleprotection on/off
- <18> Protection on/off
- <19> LED reset
- <23> Activate characteristic 1
- <24> Activate characteristic 2
- <25> Activate characteristic 3
- <26> Activate characteristic 4

1.3.5.1 Generic functions in control direction

INF Semantics

- <240> Read headings of all defined groups
- <241> Read values or attributes of all entries in one group
- <243> Read directory of a single entry
- <244> Read value or attribute of a single entry
- <245> General interrogation of generic data
- <248> Write entry
- <249> Write entry with confirmation
- <250> Write entry with execution
- <251> Write entry abort

1.3.6 Basic application functions

- Test mode
- Blocking of monitor direction
- Disturbance data
- Generic services
- Private data (*As long as ASDU type is supported by module*)

1.3.7 Miscellaneous

Measurands are transmitted with ASDU 3 as well as with ASDU 9. As defined in 7.2.6.8, the maximum MVAL can either be 1,2 or 2,4 times the rated value. No different rating shall be used in ASDU 3 and ASDU 9, i.e., for each measurand there is only one choice.

Measurand	Max. MVAL = rated value times	
	1,2	or 2,4
Current L1	<input type="checkbox"/>	<input type="checkbox"/>
Current L2	<input type="checkbox"/>	<input type="checkbox"/>
Current L3	<input type="checkbox"/>	<input type="checkbox"/>
Voltage L1-E	<input type="checkbox"/>	<input type="checkbox"/>
Voltage L2-E	<input type="checkbox"/>	<input type="checkbox"/>
Voltage L3-E	<input type="checkbox"/>	<input type="checkbox"/>
Active power P	<input type="checkbox"/>	<input type="checkbox"/>
Reactive power Q	<input type="checkbox"/>	<input type="checkbox"/>
Frequency f	<input type="checkbox"/>	<input type="checkbox"/>
Voltage L1 - L2	<input type="checkbox"/>	<input type="checkbox"/>