

# AQ2xx IEC 60870-5-103 Interoperability List

3.3.1 System functions in monitor direction

1. Physical layer
1.1 Electrical interface
X EIA RS-485 Number of loads, 32, for one equipment
1.2 Optical interface
Glass fibre Plastic fibre F-SMA type connector BFOC/2,5 type connector
1.3 Transmission speed
X 9600 bit/s X 19200 bit/s
2. Link layer
There are no choices for link layer.
3. Application layer
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.
3.2 Common address of ASDU
X One Common address of ASDU (identical with station address)  More than one Common address of ASDU
3.3 Selection of standard information numbers in monitor direction

	INF	Semantics
Χ	<0>	End of general interrogation
Χ	<0>	Time synchronization
Χ	<2>	Reset FCB
Χ	<3>	Reset CU
Χ	<4>	Start/restart
Χ	<5>	Power on

## 3.3.2 Status indications in monitor direction

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

## 3.3.3 Supervision indications in monitor direction

	INF	Semantics
Χ	<32>	Measurand supervision I
	<33>	Measurand supervision V
	<35>	Phase sequence supervision
	<36>	Trip circuit supervision
	<37>	l>> back-up operation
	<38>	VT fuse failure
	<39>	Teleprotection disturbed
	<46>	Group warning
	<47>	Group alarm

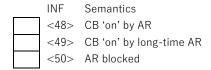
## 3.3.4 Earth fault indications in monitor direction

INF	Semantics
<48>	Earth fault L1
<49>	Earth fault L2
<50>	Earth fault L3
<51>	Earth fault forward, i.e. line
<52>	Earth fault reverse, i.e. busbar

#### 3.3.5 Fault indications in monitor direction

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

### 3.3.6 Auto-reclosure indications in monitor direction



#### 3.3.7 Measurands in monitor direction

INF	Semantics
<144 >	Measurand I
<145	Measurands I, V

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> <146 Measurands I, V, P, Q > <147 Measurands IN, VEN > X <148 Measurands IL1,2,3, VL1,2,3, P, Q, f >
```

#### 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 of 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
	>	

#### 3.4 Selection of standard information numbers in control direction

### 3.4.1 System functions in control direction

	INF	Semantics
Χ	<0>	Initiation of general interrogation
Χ	<0>	Time synchronization

### 3.4.2 General commands in control direction

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

#### 3.4.3 Generic functions in control 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 of 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
>	

### 3.5 Basic application functions

	Test mode	
	Blocking of monitor direction	
Χ	Disturbance data	
	Generic service	
Χ	Private data	

#### 3.6 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			Χ
Current L2			Χ
Current L3			X
Voltage L1-E			Χ
Voltage L2-E			Χ
Voltage L3-E			Χ
Active power P			Χ
Reactive power Q			Χ
Frequency f			Χ
Voltage L1-L2			Χ