Nemo 96HD/HD+/HDLe
Variable modules for Profibus

CONTENTS

1.0 ABSTRACT

The IF96007A is a plug in hardware module for the following devices :
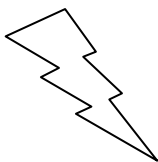
NEMO 96HD
NEMO 96HD+
NEMO 96HDLe

The measurements that are available are described in the following section and are grouped accordingly to a logical distribution to allow the user to compose his own population of variables as desired.

The import operation in a Profibus environment is so very immediate.

Physical level

Profibus – 5V according to the standard EN 50170 / up to 12 Mbit

See the installation user manual for details on how to plug in the module in safety.

2.0 VARIABLE DESCRIPTION

The following tables reports the variable descriptions with the correspondent measuring unit and the length.
Then see in the following part of the document how variables have been grouped.

The following types of format are used for the data values :

  * U_WORD   : one WORD - unsigned
  * S_WORD   : one WORD - signed
  * UD_WORDS : two WORDS - unsigned
  * SD_WORDS : two WORDS - signed

If the variable has a DWORD format, 2 WORDS are transmitted and the Most Significant Word comes before the Least Significant Word

MSB	LSB	MSB	LSB
Most Significant WORD		Least Significant WORD	

Format	Description	Unit	Variables
UD_WORD	Phase 1 : phase voltage	0.1 V	**U1**
UD_WORD	Phase 2 : phase voltage	0.1 V	**U2**
UD_WORD	Phase 3 : phase voltage	0.1 V	**U3**
UD_WORD	Chained voltage : L1-L2	0.1 V	**U12**
UD_WORD	Chained voltage : L2-L3	0.1 V	**U23**
UD_WORD	Chained voltage : L3-L1	0.1 V	**U31**
UD_WORD	Phase 1 / 12 : phase voltage min	0.1 V	**Umin1**
UD_WORD	Phase 2 / 23 : phase voltage min	0.1 V	**Umin2**
UD_WORD	Phase 3 / 31 : phase voltage min	0.1 V	**Umin3**
UD_WORD	Phase 1 / 12 : phase voltage Max	0.1 V	**UMax1**
UD_WORD	Phase 2 / 23 : phase voltage Max	0.1 V	**UMax2**
UD_WORD	Phase 3 / 31 : phase voltage Max	0.1 V	**UMax3**
UD_WORD	Phase 1 : current	0.1 A	**I1**
UD_WORD	Phase 2 : current	0.1 A	**I2**
UD_WORD	Phase 3 : current	0.1 A	**I3**
UD_WORD	Phase 1 : current demand	0.1 A	**Idmd1**
UD_WORD	Phase 2 : current demand	0.1 A	**Idmd2**
UD_WORD	Phase 3 : current demand	0.1 A	**Idmd3**
UD_WORD	Phase 1 : current peak max demand	0.1 A	**IMpd1**
UD_WORD	Phase 2 : current peak max demand	0.1 A	**IMpd2**
UD_WORD	Phase 3 : current peak max demand	0.1 A	**IMpd3**
UD_WORD	Neutral current	0.1 A	**In**
UD_WORD	3-phase average current (I1+I2+I3)/3	0.1 A	**Iav**
SD_WORD	3-phase : active power	1 W	**P**
SD_WORD	Phase 1 : active power	1 W	**P1**
SD_WORD	Phase 2 : active power	1 W	**P2**
SD_WORD	Phase 3 : active power	1 W	**P3**
SD_WORD	3-phase : reactive power	1 var	**Q**
SD_WORD	Phase 1 : reactive power	1 var	**Q1**
SD_WORD	Phase 2 : reactive power	1 var	**Q2**
SD_WORD	Phase 3 : reactive power	1 var	**Q3**
UD_WORD	3-phase : apparent power	1 VA	**S**
UD_WORD	Phase 1 : apparent power	1 VA	**S1**
UD_WORD	Phase 2 : apparent power	1 VA	**S2**
UD_WORD	Phase 3 : apparent power	1 VA	**S3**
UD_WORD	3-phase : positive active energy / low value	1 Wh	**EAL+**
UD_WORD	3-phase : positive active energy / high value	1 MWh	**EAH+**
UD_WORD	3-phase : positive reactive energy / low value	1 varh	**ERL+**
UD_WORD	3-phase : positive reactive energy / high value	1 Mvarh	**ERH+**
UD_WORD	3-phase : negative active energy / low value	1 Wh	**EAL-**
UD_WORD	3-phase : negative active energy / high value	1 MWh	**EAH-**
UD_WORD	3-phase : negative reactive energy / low value	1 varh	**ERL-**
UD_WORD	3-phase : negative reactive energy / high value	1 Mvarh	**ERH-**
UD_WORD	3-phase : partial active energy / low value	1 Wh	**EAPL+**
UD_WORD	3-phase : partial active energy / high value	1 MWh	**EAPH+**
UD_WORD	3-phase : partial reactive energy / low value	1 varh	**ERPL+**
UD_WORD	3-phase : partial reactive energy / high value	1 Mvarh	**ERPH+**

UD_WORD	3-phase : active power demand	1 W	**PDmd**
UD_WORD	3-phase : reactive power demand	1 var	**QDmd**
UD_WORD	3-phase : apparent power demand	1 VA	**SDmd**
UD_WORD	3-phase : active Max power demand	1 W	**PMpd**
UD_WORD	3-phase : reactive Max power demand	1 var	**QMpd**
UD_WORD	3-phase : apparent Max power demand	1 VA	**SMpd**
U_WORD	Frequency	0.1 Hz	**Freq**
S_WORD	3-phase : power factor	0.001	**PF**
S_WORD	Phase-1 : power factor	0.001	**PF1**
S_WORD	Phase-2 : power factor	0.001	**PF2**
S_WORD	Phase-3 : power factor	0.001	**PF3**
U_WORD	3-phase : power factor sector	0 : PF=1 1 : ind 2 : cap	**SPF**
U_WORD	Phase-1 : power factor sector	0 : PF=1 1 : ind 2 : cap	**SPF1**
U_WORD	Phase-2 : power factor sector	0 : PF=1 1 : ind 2 : cap	**SPF2**
U_WORD	Phase-3 : power factor sector	0 : PF=1 1 : ind 2 : cap	**SPF3**
U_WORD	THD U1-phase voltage/THD U12-phase-phase voltage	0.1 %	**THDU1/THDU12**
U_WORD	THD U2-phase voltage/THD U23-phase-phase voltage	0.1 %	**THDU2/THDU23**
U_WORD	THD U3-phase voltage/THD U31-phase-phase voltage	0.1 %	**THDU3/THDU31**
U_WORD	THD I1 - phase current	0.1 %	**THDI1**
U_WORD	THD I2 - phase current	0.1 %	**THDI2**
U_WORD	THD I3 - phase current	0.1 %	**THDI3**
U_WORD	Phase-1 : Harmonics of voltage U3,5,7,9	0.1 %	**H1V3,5,7,9**
U_WORD	Phase-1 : Harmonics of current I3,5,7,9	0.1 %	**H1I3,5,7,9**
U_WORD	Phase-2 : Harmonics of voltage U3,5,7,9	0.1 %	**H2V3,5,7,9**
U_WORD	Phase-2 : Harmonics of current I3,5,7,9	0.1 %	**H2I3,5,7,9**
U_WORD	Phase-3 : Harmonics of voltage U3,5,7,9	0.1 %	**H3V3,5,7,9**
U_WORD	Phase-3 : Harmonics of current I3,5,7,9	0.1 %	**H3I3,5,7,9**
U_WORD	Run hour meter	h	**RHM**
U_WORD	Current transformer ratio	No unit	**KTI**
U_WORD	Voltage transformer ratio	0.1	**KTU**
U_WORD	Voltage phase diagnostic		**VPHD**
U_WORD	Active alarms		**AL**
U_WORD	Pulse number input 1 (if module IF96011 or 012 present)	No unit	**PN1**
U_WORD	Pulse number input 2 (if module IF96011 or 012 present)	No unit	**PN2**
U_WORD	Pulse number input 3 (if module IF96011 or 012 present)	No unit	**PN3**
U_WORD	Pulse number input 4 (if module IF96011 or 012 present)	No unit	**PN4**
U_WORD	Input status 1	(**)	**IS**
U_WORD	Input status 2	(**)	**IS**

U_WORD	Input status 3	(**)	IS
U_WORD	Input status 4	(**)	IS
U_WORD	Reset of the measurements	(***)	RES
U_WORD	KTI – current transform ratio	No unit	KTI
U_WORD	KTU – voltage transformer ratio	Tenths (*)	KTU

(*) e.g. 690/100 => KTU = 69

(**) 0 : open // 1 : close or powered (for NEMO HD/HD+) ; 0 always for NEMO 96HDLe

(***) see section 4.0

3.0 MODULE DESCRIPTION

Designed for 3n-3e wiring			Designed for 2-3e wiring			Designed for 1n-1e wiring	
Variables	M1		Variables	M2		Variables	M3
U1	Y		U12	Y		U1	Y
U2	Y		U23	Y		THDU1	Y
U3	Y		U31	Y		I1	Y
U12	Y		THDU12	Y		THDI11	Y
U23	Y		THDU23	Y		Freq	Y
U31	Y		THDU31	Y		P	Y
I1	Y		I1	Y		Q	Y
I2	Y		I2	Y		S	Y
I3	Y		I3	Y		PF	Y
THDI1	Y		THDI1	Y		SPF	Y
THDI2	Y		THDI2	Y		EAL+	Y
THDI3	Y		THDI3	Y		EAH+	Y
Freq	Y		Freq	Y		ERL+	Y
P	Y		P	Y		ERH+	Y
Q	Y		Q	Y		EAL-	Y
S	Y		S	Y		EAH-	Y
P1	Y		PF	Y		ERL-	Y
P2	Y		SPF	Y		ERH-	Y
P3	Y		EAL+	Y			Y
Q1	Y		EAH+	Y			Y
Q2	Y		ERL+	Y			Y
Q3	Y		ERH+	Y			Y
PF	Y		EAL-	Y			Y
SPF	Y		EAH-	Y			Y
EAL+	Y		ERL-	Y			Y
EAH+	Y		ERH-	Y			Y
ERL+	Y						
ERH+	Y						
EAL-	Y						
EAH-	Y						
ERL-	Y						
ERH-	Y						

Voltages module			Currents module			Min & max values module	
Variables	**M4**		Variables	**M5**		Variables	**M6**
U1	Y		I1	Y		Umin1	Y
U2	Y		I2	Y		Umin2	Y
U3	Y		I3	Y		Umin3	Y
U12	Y		In	Y		UMax1	Y
U23	Y		Iav	Y		UMax2	Y
U31	Y					UMax3	Y
						Idmd1	Y
						Idmd2	Y
						Idmd3	Y
						IMpd1	Y
						IMpd2	Y
						IMpd3	Y

Harmonics module			Energies module			Power module			Power factor	
Variables	M7		Variables	M8		Variables	M9		Variables	M10
THDU1	Y		EAL+	Y		P	Y		PF	Y
THDU2	Y		EAH+	Y		Q	Y		PF1	Y
THDU3	Y		ERL+	Y		S	Y		PF2	Y
THDI1	Y		ERH+	Y		P1	Y		PF3	Y
THDI2	Y		EAL-	Y		P2	Y		SPF	Y
THDI3	Y		EAH-	Y		P3	Y		SPF1	Y
H1V3	Y		ERL-	Y		Q1	Y		SPF2	Y
H1V5	Y		ERH-	Y		Q2	Y		SPF3	Y
H1V7	Y		EAPL+	Y		Q3	Y		Freq	Y
H1V9	Y		EAPH+	Y		S1	Y		RHM	Y
H2V3	Y		ERPL+	Y		S2	Y			
H2V5	Y		ERPH+	Y		S3	Y			
H2V7	Y					PDmd	Y			
H2V9	Y					QDmd	Y			
H3V3	Y					SDmd	Y			
H3V5	Y					PMpd	Y			
H3V7	Y					QMpd	Y			
H3V9	Y					SMpd	Y			
H1I3	Y									
H1I5	Y									
H1I7	Y									
H1I9	Y									
H2I3	Y									
H2I5	Y									
H2I7	Y									
H2I9	Y									
H3I3	Y									
H3I5	Y									
H3I7	Y									
H3I9	Y									

General variable			THD module			Variable Reset		
Variables	**M11**		Variables	**M12**		Variables	**M13**	
VPHD	**Y**		**THDU1**	**Y**		**RES**	**Y**	This is the only writable
AL	**Y**		**THDU2**	**Y**				module and is used to reset
PN1	**Y**		**THDU3**	**Y**				the quantities of the meter.
PN2	**Y**		**THDI1**	**Y**				
PN3	**Y**		**THDI2**	**Y**				
PN4	**Y**		**THDI3**	**Y**				
IS1	**Y**							
IS2	**Y**							
IS3	**Y**							
IS4	**Y**							
KTI	**Y**							
KTU	**Y**							

4.0 VARIABLE RESET

To reset desired measurements write the following word (in binary) :

```
    MSB                             LSB
     0|0|0|0|0|0|0|b8|b7|b6|b5|b4|b3|b2|b1|b0

     b0 = 1  =>  Reset Hour Meter
     b1 = 1  =>  Reset Peak Maximum Demand
     b2 = 1  =>  Reset Maximum Voltage values
     b3 = 1  =>  Reset Maximum Current values
     b4 = 1  =>  Reset Minimum Voltage values
     b5 = 1  =>  Reset Active Partial Energy
     b6 = 1  =>  Reset Reactive Partial Energy
     b7 = 1  =>  Reset Counter Input 1
     b8 = 1  =>  Reset Counter Input 2

     b9 .. b15 = 0
```