MOTOR PROTECTION & CONTROL TECHNOLOGY

NewCode
Profibus DPV1
Communication Module

User Manual

NC-MK1-PROFI-DP1
Version 2E-01
(NE_NC-MK1-PROFI-DP1_MAN_02_13_E-01)

2 April 2013

Content

1. ABSTRACT

The NC-MK1-PROFI-DP1 (NewCode Profibus DPV1) acts as a translator between the Profibus SCADA and the NewCode. It is advisable to read the NewCode user manual, as some of the topics will require knowledge on the NewCode. It is also advisable to have knowledge on profibus. Information on profibus can be found at the web site www.profibus.com.

The communication protocol between the NC-MK1-PROFI-DP1 and SCADA is Profibus DPV1 class 1 and class 2. Communication protocol between the NC-MK1-PROFI-DP1 and the NewCode is a CHI proprietary protocol. Enabling the PLC to communicate with the NewCode via Profibus DPV1.

2. SPECIFICATIONS

2.1 Technical Specifications of NC-MK1-PROFI-DP1

General Data	Mounting Positions	● Mounted inside of NewCode.
	Allowed Ambient Temperature	● Operation : 0 ºC to +60 ºC
	Humidity	● < 87%
NC-MK1-PROFI-DP0	Power Supply	● +5Vdc
	Consumption	● 100 mA
	Communication Mediums	● Profibus ● I2C
Profibus	Protocol	● Profibus DPV1
	Baud Rate	● 9600 bit/s to 12 Mbit/s
	Cable Length @ Baud Rate	● 1200 m @ 9600 bit/s to 45450 bit/s ● 1000 m @93.75Kbit/s to 187.5Kbit/s ● 400 m @ 500 Kbit/s ● 200 m @ 1.5 Mbit/s ● 100 m @ 3 Mbit/s to 12 Mbit/s
	Termination Resistor (Termination resistors must be connected at the beginning and end of bus)	● 220 Ohm.
Indication Lights	Type	● Light Emitting Diode (LED)
	LED Indications	● SCADA Communication ● Address Of Module ○ Green Flash = 1 ○ Red Flash = 10 ○ Orange Flash = 100 ○ Orange Solid = I2C Error ○ Red Solid = VPC Error

2.2 GSD Files

GSD files stands for generic station description. These files help the PLC to under stand the device that is connected to the bus.

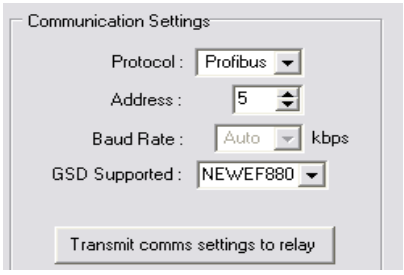
The GSD file describes the following to the PLC:

- Device specifications.
- Parameters of the device.
- Cyclic data in and out.
- Acyclic data.
- Diagnostic data.

Two different GSD files can be used to describe the NewCode. NEWEF877 and NEWEF880.

NEWEF880 will not work on the MA-Relay.

The GSD files and profibus address can be setup on the NewCode frontend under the “Comm+Statistic” tab.



2.2.1 NEWEF880 GSD File (NewCode)

Describes the NewCode relay as a NewCode relay with DPV1 functionality.

2.2.2 NEWEF877 GSD File (MA-Relay)

Will describe the NewCode relay as a MA-Relay. Allowing old plants to change there MA-Relays to NewCode relays without changing there SCADA configurations.

This GSD file will convert the NewCode relay to only work as a DPV0 slave device. All DPV1 functionality will not work.

2.3 Structure Of The Parameterization Telegram For NewCode

The parameterization telegram data will look as follow:

Byte Addr	Parameter Name	Description	Range
0 ~ 2	DPV1 Selection	Profibus DPV1 settings.	Set
3	CM-Settings • Bit 0 • Bit 1 • Bit 2 • Bit 7	Communication module settings. • Overwrite Relay Settings. • Overwrite Relay Logic Control. • Overwrite Relay Starter Logic. • Fail Safe Enabled.	
4	Cyclic Dout Amount	Cyclic amount of bytes from PLC to NewCode. • Byte 1 and 2 is PLC control byte. • Byte 3 for analogue 1 out. • Byte 4 for analogue 2 out.	1 ~ 4
5	Cyclic Din Amount	Cyclic amount of words from NewCode to PLC.	1 ~ 6
6 ~ 11	Word In Ptr 1~6	Pointer to NewCode Cyclic Actual Values (2.3.1)	0~255
12	Maximum Load 0	Maximum load setting for low speed in percentage.	10~100
13	Thermal Curve Class 0	Thermal class model selected for low speed in sec.	5~45
14	Maximum Load 1	Maximum load setting for high speed in %.	10~100
15	Thermal Curve Class 1	Thermal class model selected for high speed in sec.	5~45
16	Relay Modal	Modal number of the relay • 0 = NC 1 • 1 = NC 5 • 2 = NC 25 • 3 = NC 50 • 4 = NC 100 • 5 = NC 300	0~4
17~18	CT Primary	Primary CT ratio	1 ~ 1000
19	CT Secondary	Secondary CT Ratio	1 ~ 9

20	Volt Selection	Voltage line input level selector. • 0 = 110 Vac. • 1 = 380 Vac. • 2 = 400 Vac. • 3 = 525 Vac. • 4 = 550 Vac. • 5 = 680 Vac. • 6 = 950 Vac. • 7 = 1K1 Vac. • 8 = 3K3 Vac. • 9 = 6K6 Vac. • 10 = 11K Vac.	0~10
21	Volt Sym. Trip Level	Voltage symmetric trip level in percentage.	1~100
22	Voltage High Limit	Voltage high limit for over voltage in %.	0 ~ 15
23	Voltage Low Limit	Voltage low limit for under voltage in %.	0 ~ 15
24	Unbalance Trip Level	Unbalance trip level in percentage.	0~50
25	Unbalance Trip Delay	Unbalance trip delay in seconds.	1~10
26	ML Run Trip Delay	Minimum load running trip delay in seconds.	1~10
27	ML Start up Trip Delay	Minimum load start up hold off delay in sec.	1~200
28	ML Reset Timer.	Time it will take to reset relay after trip. • 0 = Manual. • 1 = 10 Seconds. • 2 = 5 Minutes. • 3 = 10 Minutes. • 4 = 20 Minutes. • 5 = 30 Minutes. • 6 = 45 Minutes. • 7 = 1 Hour. • 8 = 3 Hours. • 9 = 6 Hours.	0 ~ 9
29	ML Trip Level.	Minimum load trip level in percentage of MLC.	10 ~ 100
30	ML Power Factor Trip Level	Minimum load power factor trip level in %.	10 ~ 100
31 ~ 32	EL Trip Level • Byte 0 • Byte 1	Earth leakage trip level in milli Amps. • Higher Byte. • Lower Byte.	100 ~ 999
33	EL Trip Type	Trip must be instantaneous or inverse define minimum time. • 0 = INST. • 1 = IDMT	0 ~ 1

34 ~ 35	EL Trip Time INST	Trip time in ms for INST selected in ms incremental 50.	100 ~ 1000
36 ~ 37	Running Stall Trip Level	Running stall trip level in percentage.	110 ~ 300
38	Running Stall Hold Off Time	Hold off time for running stall to trip in sec.	0 ~ 200
39 ~ 40	Running Stall Trip Delay	Delay it will take to trip the relay on running stall in ms with incremental of 50.	100 ~ 2000
41	Thermal Class Reset Level	Reset level that thermal level must build up to reset relay after a thermal trip.	
42	Starts Per Hour	Starts that can be attempted in a hour.	1 ~ 60
43	Consecutive Starts	Starts that can be taken after a start failed.	1 ~ 3
44	Control Byte A • Bit 0 • Bit 1 • Bit 2 • Bit 3 • Bit 4 • Bit 5 • Bit 6 • Bit 7	NewCode control byte A. • Minimum Load Enabled. • Under Voltage Enabled. • Over Voltage Enabled. • Voltage Symmetric Trip Enabled. • Fail Safe Selected. • Unbalance Trip Enabled. • Phase Rotation Trip Enabled. • Short Circuit Trip Enabled.	0 ~ 255
45	Control Byte B • Bit 0 • Bit 1 • Bit 2 • Bit 3 • Bit 4 • Bit 5 • Bit 6 • Bit 7	NewCode control byte B. • Single Phase Trip Enabled. • Running Stall Trip Enabled. • (0) Under Current Trip / (1) Power Factor Trip Enabled. • Earth Leakage Trip Enabled. • Low Pass Filter Enabled. • Isolation Lockout Trip Enabled. • Frequency Trip Enabled. • Thermal Auto Calculate Reset Enabled.	0 ~ 255

46	Control Byte C • Bit 0 • Bit 1 • Bit 2 • Bit 3 • Bit 4 • Bit5 • Bit6	NewCode control byte C. • Starts Per Hour Enabled. • Voltage Phase Rotation Reversed. • Vectorial Stall Trip Enabled. • Auto Thermal Reset Enabled. • Relay 1 = (0) Main Trip Relay Enabled / (1) Mappable Relay. • External I/O Connected. • FLED Connected	0 ~ 255
47	Control Byte D	NewCode control byte D. • RTD 1 Enabled. • RTD 2 Enabled. • RTD 3 Enabled. • RTD 4 Enabled. • Analog In 1 Enabled . • Analog In 2 Enabled. • Analog Out 1 Enabled • Analog Out 2 Enabled	0 ~ 255
48	Starter Type	Type of starter logic: • 0 = Protection. • 1 = Direct On Line. • 2 = Reversal Direct On Line. • 3 = Star-Delta. • 4 = Reversal Star-Delta. • 5 = Dahlander. • 6 = Reversal Dahlander. • 7 = Pole Changing. • 8 = Reversal Pole Changing. • 9 = Soft Starter. • 10 = Reversal Soft Starter. • 11 = Oil Circuit Breaker Direct Online.	0 ~ 11

49	RTD Type	RTD Type Bit 0 ~ 1 = RTD1 ➢ 00 = PT100 ➢ 01 = PT1000 ➢ 10 = PTC ➢ 11 = NTC Bit 2 ~ 4 = RTD2 ➢ 00 = PT100 ➢ 01 = PT1000 ➢ 10 = PTC ➢ 11 = NTC Bit 5 ~ 6 = RTD3 ➢ 00 = PT100 ➢ 01 = PT1000 ➢ 10 = PTC ➢ 11 = NTC Bit 7 ~ 8 = RTD 4 ➢ 00 = PT100 ➢ 01 = PT1000 ➢ 10 = PTC ➢ 11 = NTC	0 ~ 255
50	Field Input 1 Delay	Delay for input 1 state to register in ms. Multiplier 50ms	0 ~ 40
51	Field Input 2 Delay	Delay for input 2 state to register in ms. Multiplier 50ms	0 ~ 40
52	Field Input 3 Delay	Delay for input 3 state to register in ms. Multiplier 50ms	0 ~ 40
53	Field Input 4 Delay	Delay for input 4 state to register in ms. Multiplier 50ms	0 ~ 40
54	Field Input 5 Delay	Delay for input 5 state to register in ms. Multiplier 50ms	0 ~ 40
55	Field Input 6 Delay	Delay for input 6 state to register in ms. Multiplier 50ms	0 ~ 40
56	Field Input 7 Delay	Delay for input 7 state to register in ms. Multiplier 50ms	0 ~ 40
57	Field Input 8 Delay	Delay for input 8 state to register in ms. Multiplier 50ms	0 ~ 40
58	Field Input 9 Delay	Delay for input 9 state to register in ms. Multiplier 50ms	0 ~ 40
59	Field Input 10 Delay	Delay for input 10 state to register in ms. Multiplier 50ms	0 ~ 40

60	Field Input 11 Delay	Delay for input 11 state to register in ms. Multiplier 50ms	0 ~ 40
61	Field Input 12 Delay	Delay for input 12 state to register in ms. Multiplier 50ms	0 ~ 40
62	Field Input 13 Delay	Delay for input 13 state to register in ms. Multiplier 50ms	0 ~ 40
63	Field Input 14 Delay	Delay for input 14 state to register in ms. Multiplier 50ms	0 ~ 40
64	Field Input 15 Delay	Delay for input 15 state to register in ms. Multiplier 50ms	0 ~ 40
65	RTD 1 Hi Trip Level	Thermal high trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
66	RTD 1 Hi Warning Level	Thermal high trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
67	RTD 1 Lo Warning Level	Thermal lower trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
68	RTD 1 Lo Trip Level	Thermal lower trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
69	RTD 2 Hi Trip Level	Thermal high trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
70	RTD 2 Hi Warning Level	Thermal high trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
71	RTD 2 Lo Warning Level	Thermal lower trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
72	RTD 2 Lo Trip Level	Thermal lower trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
73	RTD 3 Hi Trip Level	Thermal high trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
74	RTD 3 Hi Warning Level	Thermal high trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
75	RTD 3 Lo Warning Level	Thermal lower trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
76	RTD 3 Lo Trip Level	Thermal lower trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
77	RTD 4 Hi Trip Level	Thermal high trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
78	RTD 4 Hi Warning Level	Thermal high trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250

79	RTD 4 Lo Warning Level	Thermal lower trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
80	RTD 4 Lo Trip Level	Thermal lower trip level. -30 to 220 Degrees. (value – 30)	0 ~ 250
81	Ana In 1 Hi Trip Level	Analog In 1 high trip level count.	0 ~ 255
82	Ana In 1 Hi Warn Level	Analog In 1 high warning level count.	0 ~ 255
83	Ana In 1 Lo Warn Level	Analog In 1 lower warning level count.	0 ~ 255
84	Ana In 1 Lo Trip Level	Analog In 1 lower trip level count.	0 ~ 255
85	Ana In 2 Hi Trip Level	Analog In 2 high trip level count.	0 ~ 255
86	Ana In 2 Hi Warn Level	Analog In 2 high warning level count.	0 ~ 255
87	Ana In 2 Lo Warn Level	Analog In 2 lower warning level count.	0 ~ 255
88	AnaOut 2 Lo Trip Level	Analog In 2 lower trip level count.	0 ~ 255
89	AnaOut 1 Hi Trip Level	Analog Out 1 high trip level count.	0 ~ 255
90	AnaOut 1 Hi Warn Level	Analog Out 1 high warning level count.	0 ~ 255
91	AnaOut 1 Lo Warn Level	Analog Out 1 lower warning level count.	0 ~ 255
92	AnaOut 1 Lo Trip Level	Analog Out 1 lower trip level count.	0 ~ 255
93	AnaOut 2 Hi Trip Level	Analog Out 2 high trip level count.	0 ~ 255
94	AnaOut 2 Hi Warn Level	Analog Out 2 high warning level count.	0 ~ 255
95	AnaOut 2 Lo Warn Level	Analog Out 2 lower warning level count.	0 ~ 255
96	AnaOut 2 Lo Trip Level	Analog Out 2 lower trip level count.	0 ~ 255
97	Logic Function 1 Output Table	Mask for logic function 1 for switching logic function 1.	0 ~ 255
98 ~ 100	Logic Function 1 Input Pointer A to C • Byte 0 • Byte 1 • Byte 2	Points to a input bit from the function flag table (2.3.2) • Input Pointer A • Input Pointer B • Input Pointer C	0 ~ 255
101	Logic Function 2 Output Table	Mask for logic function 1 for switching logic function 2.	0 ~ 255
102 ~ 104	Logic Function 2 Input Pointer A to C • Byte 0 • Byte 1 • Byte 2	Points to a input bit from the function flag table (2.3.2) • Input Pointer A • Input Pointer B • Input Pointer C	0 ~ 255
105	Logic Function 3 Output Table	Mask for logic function 1 for switching logic function 3.	0 ~ 255

106 ~ 108	Logic Function 3 Input Pointer A to C • Byte 0 • Byte 1 • Byte 2	Points to a input bit from the function flag table (2.3.2) • Input Pointer A • Input Pointer B • Input Pointer C	0 ~ 255
109	Logic Function 4 Output Table	Mask for logic function 1 for switching logic function 4.	0 ~ 255
110 ~ 112	Logic Function 4 Input Pointer A to C • Byte 0 • Byte 1 • Byte 2	Points to a input bit from the function flag table (2.3.2) • Input Pointer A • Input Pointer B • Input Pointer C	0 ~ 255
113	Logic Function 5 Output Table	Mask for logic function 1 for switching logic function 5.	0 ~ 255
114 ~ 116	Logic Function 5 Input Pointer A to C • Byte 0 • Byte 1 • Byte 2	Points to a input bit from the function flag table (2.3.2) • Input Pointer A • Input Pointer B • Input Pointer C	0 ~ 255
117	Logic Function 6 Output Table	Mask for logic function 1 for switching logic function 6.	0 ~ 255
118 ~ 120	Logic Function 6 Input Pointer A to C • Byte 0 • Byte 1 • Byte 2	Points to a input bit from the function flag table (2.3.2) • Input Pointer A • Input Pointer B • Input Pointer C	0 ~ 255
121 ~ 122	Timer A Time Out • Byte 0 • Byte 1	Time out in seconds. • Higher Byte. • Lower Byte.	1 ~ 3000
123	Timer A Start Input	Bit from the function flag table (2.3.2) .	0 ~ 255
124	Timer A Reset Input	Bit from the function flag table (2.3.2).	0 ~ 255
125 ~ 126	Timer B Time Out • Byte 0 • Byte 1	Time out in seconds. • Higher Byte. • Lower Byte.	1 ~ 3000
127	Timer B Start Input	Bit from the function flag table (2.3.2).	0 ~ 255
128	Timer B Reset Input	Bit from the function flag table (2.3.2).	0 ~ 255
129	Counter A Limit	Counters maximum value.	1 ~ 250
130	Counter A Count Up	Bit from the function flag table (2.3.2).	0 ~ 255
131	Counter A Count Down	Bit from the function flag table (2.3.2).	0 ~ 255

132	Counter A Reset	Bit from the function flag table (2.3.2).	0 ~ 255
133	Counter B Limit	Counters maximum value.	1 ~ 250
134	Counter B Count Up	Bit from the function flag table (2.3.2).	0 ~ 255
135	Counter B Count Down	Bit from the function flag table (2.3.2).	0 ~ 255
136	Counter B Reset	Bit from the function flag table (2.3.2).	0 ~ 255
137	Status Reporter	Bit from the function flag table (2.3.2).	0 ~ 255
138	Latch A Set	Bit from the function flag table (2.3.2).	0 ~ 255
139	Latch A Reset	Bit from the function flag table (2.3.2).	0 ~ 255
140	Latch B Set	Bit from the function flag table (2.3.2).	0 ~ 255
141	Latch B Reset	Bit from the function flag table (2.3.2).	0 ~ 255
142	Pulse Generator Set	Bit from the function flag table (2.3.2).	0 ~ 255
143	Pulse Gen Period	Period timer for the pulse generator in minutes.	1 ~ 240
144	Pulse Gen Duty	Duty cycle for the pulse genarator.	1 ~ 100
145	RTC Hour Start	Start time hour value in BCD format.	0 ~ 255
146	RTC Minutes Start	Start time minutes value in BCD format.	0 ~ 255
147	RTC Hour Stop	Stop time hour value in BCD format.	0 ~ 255
148	RTC Minutes Stop	Stop time minutes value in BCD format.	0 ~ 255
149	Relay 1	Bit from the function flag table (2.3.2).	0 ~ 255
150	Relay 2	Bit from the function flag table (2.3.2).	0 ~ 255
151	Relay 3	Bit from the function flag table (2.3.2).	0 ~ 255
152	Relay 4	Bit from the function flag table (2.3.2).	0 ~ 255
153	Relay 5	Bit from the function flag table (2.3.2).	0 ~ 255
154	Relay 6	Bit from the function flag table (2.3.2).	0 ~ 255
155	Relay 7	Bit from the function flag table (2.3.2).	0 ~ 255
156	Relay 8	Bit from the function flag table (2.3.2).	0 ~ 255
157	Reset Input	Bit from the function flag table (2.3.2).	0 ~ 255
158	TC Warning Level	Bit from the function flag table (2.3.2).	0~255
159	Local Remote lsb	Bit from the function flag table (2.3.3).	0 ~ 255
160	Local Remote msb	Bit from the function flag table (2.3.3).	0 ~ 255
161	Local Start Forward Fast	Bit from the function flag table (2.3.4).	0 ~ 255
162	Local Start Forward Slow	Bit from the function flag table (2.3.4).	0 ~ 255
163	Local Start Reverse Fast	Bit from the function flag table (2.3.4).	0 ~ 255

164	Local Start Reverse Slow	Bit from the function flag table (2.3.4).	0 ~ 255
165	Local Interlock	Bit from the function flag table (2.3.4).	0 ~ 255
166	Local Stop	Bit from the function flag table (2.3.4).	0 ~ 255
167	Remote Start Forward Fast	Bit from the function flag table (2.3.4).	0 ~ 255
168	Remote Start Forward Slow	Bit from the function flag table (2.3.4).	0 ~ 255
169	Remote Start Reverse Fast	Bit from the function flag table (2.3.4).	0 ~ 255
170	Remote Start Reverse Slow	Bit from the function flag table (2.3.4).	0 ~ 255
171	Remote Interlock	Bit from the function flag table (2.3.4).	0 ~ 255
172	Remote Stop	Bit from the function flag table (2.3.4).	0 ~ 255
173	Auto Start Forward Fast	Bit from the function flag table (2.3.4).	0 ~ 255
174	Auto Start Forward Slow	Bit from the function flag table (2.3.4).	0 ~ 255
175	Auto Start Reverse Fast	Bit from the function flag table (2.3.4).	0 ~ 255
176	Auto Start Reverse Slow	Bit from the function flag table (2.3.4).	0 ~ 255
177	Auto Interlock	Bit from the function flag table (2.3.4).	0 ~ 255
178	Auto Stop	Bit from the function flag table (2.3.4).	0 ~ 255
179	Feedback Signal Input	Bit from the function flag table (2.3.4).	0 ~ 255
180 ~ 181	Pre Start Warning Timer	Time for the pre start siren in seconds.	1 ~ 3000
182	Execution Timer	Time for the execution signal to pick up feedback signal in seconds.	1 ~ 10
183	Feedback Timer	Time for the feedback signal to pick up feedback signal in seconds. Multiplier with 50ms	1 ~ 40
184 ~ 185	Back Spin Timer	Time for the motor to run down in seconds.	1 ~ 3000
186	DC Break Timer	Time to how long the DC break should be engaged in ms with 50 incremental.	1 ~ 40
187 ~ 188	Restart Timer	Time it will take to restart the motor after a power failure in seconds.	1 ~ 3000

189	Star Maximum Timer	Maximum time for the star sequence in a star delta circuit in seconds.	1 ~ 40
190	Transition Timer	Time it will take to go from high to low speed in ms.	1 ~ 40
191	Frozen Contact Timer	Time till relay will trip on frozen contact.	1 ~ 40

2.3.1 NewCode Cyclic Data Of Actual Values

Values that can be routed to the PLC words 1 to 6. This will describe the cyclic data going from the NewCode to PLC.

Address	Name
0	TC remaining
1	Current Level.
2	Red Phase Current Level.
3	White Phase Current Level.
4	Blue Phase Current Level.
5	Voltage Line Level.
6	Red Phase Voltage Level.
7	White Phase Voltage Level.
8	Blue Phase Voltage Level.
9	Unbalance Level.
10	Voltage Symmetric Level.
11	Earth Leakage Level.
12	Power Factor Level.
13	Frequency Level.
14	Isolation Level.

15	Alarm Flags A. • Bit 0 = In Service. • Bit 1 = Earth Leakage. • Bit 2 = Over Current. • Bit 3 = Running Stall. • Bit 4 = Unbalance. • Bit 5 = Single Phase. • Bit 6 = Minimum Load. • Bit 7 = Short Circuit. • Bit 8 = Voltage Present. • Bit 9 = Over Voltage. • Bit 10 = Under Voltage. • Bit 11 = Voltage Symmetric. • Bit 12 = Insulation Lock Out. • Bit 13 = Low Frequency. • Bit 14 = High Frequency. • Bit 15 = Earth Fault.
16	Alarm Flags B. • Bit 0 = Vectorial Stall. • Bit 1 = Frozen Contact. • Bit 2 ~ 7 = Reserved. • Bit 8 = RTD 1 Hi. • Bit 9 = RTD 1 Lo. • Bit 10 = RTD 2 Hi. • Bit 11 = RTD 2 Lo. • Bit 12 = RTD 3 Hi. • Bit 13 = RTD 3 Lo. • Bit 14 = RTD 4 Hi. • Bit 15 = RTD 4 Lo.
17	Alarm Flags C. • Bit 0 = Analogue In 1 Hi. • Bit 1 = Analogue In 1 Lo. • Bit 2 = Analogue In 2 Hi. • Bit 3 = Analogue In 2 Lo. • Bit 4 = Analogue Out 1 Hi. • Bit 5 = Analogue Out 1 Lo. • Bit 6 = Analogue Out 2 Hi. • Bit 7 = Analogue Out 2 Lo. • Bit 8 ~ 15 = Reserved

18	Trip Flags A. • Bit 0 = Over Current. • Bit 1 = Running Stall. • Bit 2 = Unbalance. • Bit 3 = Single Phase. • Bit 4 = Minimum Load. • Bit 5 = Short Circuit. • Bit 6 = Phase Rotation. • Bit 7 = Earth Leakage. • Bit 8 = Over Voltage. • Bit 9 = Under Voltage. • Bit 10 = Voltage Symmetric. • Bit 11 = Insulation Lock Out. • Bit 12 = Low Frequency. • Bit 13 = High Frequency. • Bit 14 = Earth Fault. • Bit 15 = Starts Per Hour.
19	Trip Flags B. • Bit 0 = System Failure. • Bit 1 = Vectorial Stall. • Bit 2 = Frozen Contact. • Bit 3 = Execution. • Bit 4 = Feedback. • Bit 5 = Unauthorized Current. • Bit 6 ~ 7 = Reserved. • Bit 8 = RTD 1 Hi. • Bit 9 = RTD 1 Lo. • Bit 10 = RTD 2 Hi. • Bit 11 = RTD 2 Lo. • Bit 12 = RTD 3 Hi. • Bit 13 = RTD 3 Lo. • Bit 14 = RTD 4 Hi. • Bit 15 = RTD 4 Lo.
20	Trip Flags C. • Bit 0 = Analogue In 1 Hi. • Bit 1 = Analogue In 1 Lo. • Bit 2 = Analogue In 2 Hi. • Bit 3 = Analogue In 2 Lo. • Bit 4 = Analogue Out 1 Hi. • Bit 5 = Analogue Out 1 Lo. • Bit 6 = Analogue Out 2 Hi. • Bit 7 = Analogue Out 2 Lo. • Bit 8 ~ 15 = Reserved.

21	Warning Flags • Bit 0 = RTD 1 Hi. • Bit 1 = RTD 1 Lo. • Bit 2 = RTD 2 Hi. • Bit 3 = RTD 2 Lo. • Bit 4 = RTD 3 Hi. • Bit 5 = RTD 3 Lo. • Bit 6 = RTD 4 Hi. • Bit 7 = RTD 4 Lo. • Bit 8 = Analogue In 1 Hi. • Bit 9 = Analogue In 1 Lo. • Bit 10 = Analogue In 2 Hi. • Bit 11 = Analogue In 2 Lo. • Bit 12 = Analogue Out 1 Hi. • Bit 13 = Analogue Out 1 Lo. • Bit 14 = Analogue Out 2 Hi. • Bit 15 = Analogue Out 2 Lo.
22	Function Status Word 0. • Bit 0 = Logic Function 1 Output. • Bit 1 = Logic Function 2 Output. • Bit 2 = Logic Function 3 Output. • Bit 3 = Logic Function 4 Output. • Bit 4 = Logic Function 5 Output. • Bit 5 = Logic Function 6 Output. • Bit 6 = Simulation Active. • Bit 7 = Counter B Output. • Bit 8 = Timer A Output. • Bit 9 = Timer B Output. • Bit 10 = Real Time Clock Output. • Bit 11 = Relay 1 Output. • Bit 12 = Relay 2 Output. • Bit 13 = Relay 3 Output. • Bit 14 = Relay 4 Output. • Bit 15 = Counter A Output.

23	Function Status Word 1. • Bit 0 = Field Input 1. • Bit 1 = Field Input 2. • Bit 2 = Field Input 3. • Bit 3 = Field Input 4. • Bit 4 = Field Input 5. • Bit 5 = Field Input 6. • Bit 6 = Field Input 7. • Bit 7 = Reserved. • Bit 8 = Starter Output 1. • Bit 9 = Starter Output 2. • Bit 10 = Starter Output 3. • Bit 11 = Starter Output 4. • Bit 12 = Starter Output 5. • Bit 13 = Reserved. • Bit 14 = Local Select Bit lsb. • Bit 15 = Local Select Bit msb.
24	Function Status Word 2. • Bit 0 = PLC Input Bit 1. • Bit 1 = PLC Input Bit 2. • Bit 2 = PLC Input Bit 3. • Bit 3 = PLC Input Bit 4. • Bit 4 = PLC Input Bit 5. • Bit 5 = PLC Input Bit 6. • Bit 6 = PLC Input Bit 7. • Bit 7 = PLC Input Bit 8. • Bit 8 = PLC Input Bit 9. • Bit 9 = PLC Input Bit 10. • Bit 10 = PLC Input Bit 11. • Bit 11 = PLC Input Bit 12. • Bit 12 = PLC Input Bit 13. • Bit 13 = PLC Input Bit 14. • Bit 14 = PLC Input Bit 15. • Bit 15 = PLC Input Bit 16.

25	Function Status Word 3. • Bit 0 = Timer A Pulse Output. • Bit 1 = Timer B Pulse Output. • Bit 2 = Status Reporter Output. • Bit 3 = Latch Output A. • Bit 4 = Relay 5. • Bit 5 = Relay 6. • Bit 6 = Relay 7. • Bit 7 = Relay 8. • Bit 8 = Pre Start warning Signal. • Bit 9 = DC breaker Active. • Bit 10 = Transition Active. • Bit 11 = Backspin Active. • Bit 12 = Reserved. • Bit 13 = Latch Output B. • Bit 14 = Reserved. • Bit 15 = TC warning level.
26	Function Status Word 4. • Bit 0 = Field Input 8. • Bit 1 = Field Input 9. • Bit 2 = Field Input 10. • Bit 3 = Field Input 11. • Bit 4 = Field Input 12. • Bit 5 = Field Input 13. • Bit 6 = Field Input 14. • Bit 7 = Field Input 15. • Bit 8~15 = Reserved.
27	Counter A Value.
28	Counter B Value.
29	Start-up Counter
30	Trip Counter
31	Motor Total Running Hour Counter
32	Motor Full Load Running Hour Counter
33	Relay Running Hour Counter
34	Apparent Power Consumption
35	Real Power Consumption
36	DP Address

37	Communication Status • Bit 0 to 3 = Baud rate. ◦ 0000 = 12 Mbit/s. ◦ 0001 = 6 Mbit/s. ◦ 0010 = 3 Mbit/s. ◦ 0011 = 1,5 Mbit/s. ◦ 0100 = 500 Kbit/s. ◦ 0101 = 187,5 Kbit/s. ◦ 0110 = 93,75 Kbit/s. ◦ 0111 = 45,45 Kbit/s. ◦ 1000 = 19,2 Kbit/s. ◦ 1001 = 9,6 Kbit/s. ◦ 1111 = Baud rate not detected. • Bit 4 to 7 = Chip Revision. ◦ 0000 = Revision A. ◦ 1011 = Revision B. ◦ 1100 = Revision C. ◦ 1101 = Revision D. • Bit 8 to 11 = Reserved. • Bit 12 and 13 = DP State Machine. ◦ 00 = Waiting for parameters. ◦ 01 = Waiting for configurations. ◦ 10 = Data exchange. • Bit 14 and 15 = Watch Dog State Machine. ◦ 00 = Baud search. ◦ 01 = Baud control. ◦ 10 = DP control.
38	Cyclic Time Measurement.
39	Cyclic Time Positive Time Deviation.
40	Cyclic Time Negative Time Deviation.

2.3.2 Function Flag Table 1

It is signals that can be routed to the inputs of the logic functions, timers, counters, status reporter, latch, starter control and relays.

Address	Name
0	Constant Zero
1	Constant One
2	In Service Flag
3	Voltage Present Flag
4	Over Current Alarm Flag
5	Short Circuit Alarm Flag
6	Running Stall Alarm Flag
7	Unbalance Alarm Flag
8	Single Phase Alarm Flag
9	Earth Fault Alarm Flag
10	Earth Leakage Alarm Flag
11	Minimum Load Alarm Flag
12	Over Voltage Alarm Flag
13	Under Voltage Alarm Flag
14	Voltage Symmetric Alarm Flag
15	High Frequency Alarm Flag
16	Low Frequency Alarm Flag
17	Isolation Lockout Alarm Flag
18	Frozen Contact Alarm Flag
19	Over Current Trip Flag
20	Short Circuit Trip Flag
21	Running Stall Trip Flag
22	Unbalance Trip Flag
23	Single Phase Trip Flag
24	Earth Fault Trip Flag
25	Earth Leakage Trip Flag
26	Minimum Load Trip Flag
27	Over Voltage Trip Flag
28	Under Voltage Trip Flag
29	Voltage Symmetric Trip Flag
30	High Frequency Trip Flag
31	Low Frequency Trip Flag

32	Insulation Lockout Trip Flag
33	Phase Rotation Trip Flag
34	Starts Per Hour Trip Flag
35	Frozen Contact Trip Flag
36	Trip Flag
37	Timer A Output
38	Inverted Timer A Output
39	Timer A Pulsed Output
40	Inverted Timer A Pulsed Output
41	Timer B Output
42	Inverted Timer B Output
43	Timer B Pulsed Output
44	Inverted Timer B Pulsed Output
45	RTC Output
46	Inverted RTC Output
47	Counter A Output
48	Inverted Counter A Output
49	Counter B Output
50	Inverted Counter B Output
51	Logical Function 1 Output
52	Inverted Logical Function 1 Output
53	Logical Function 2 Output
54	Inverted Logical Function 2 Output
55	Logical Function 3 Output
56	Inverted Logical Function 3 Output
57	Logical Function 4 Output
58	Inverted Logical Function 4 Output
59	Logical Function 5 Output
60	Inverted Logical Function 5 Output
61	Logical Function 6 Output
62	Inverted Logical Function 6 Output
63	Field Input 1
64	Field Input 2
65	Field Input 3
66	Field Input 4
67	Field Input 5
68	Field Input 6
69	Field Input 7

70	Field Input 8
71	Field Input 9
72	Field Input 10
73	Field Input 11
74	Field Input 12
75	Field Input 13
76	Field Input 14
77	Field Input 15
78	PLC Input Bit 1
79	PLC Input Bit 2
80	PLC Input Bit 3
81	PLC Input Bit 4
82	PLC Input Bit 5
83	PLC Input Bit 6
84	PLC Input Bit 7
85	PLC Input Bit 8
86	PLC Input Bit 9
87	PLC Input Bit 10
88	PLC Input Bit 11
89	PLC Input Bit 12
90	PLC Input Bit 13
91	PLC Input Bit 14
92	PLC Input Bit 15
93	PLC Input Bit 16
94	Restart Flag
95	Status Reporter Output
96	Latch A Output
97	Latch B Output
98	Pulse Generator Output
99	TC Warning Alarm
100	Execution Trip flag
101	Feedback trip flag
102	Unauthorized current trip flag
103	System failure trip flag
104	RTD 1 high warning flag
105	RTD 1 high alarm flag
106	RTD 1 high trip flag
107	RTD 1 low warning flag

108	RTD 1 low alarm flag
109	RTD 1 low trip flag
110	RTD 2 high warning flag
111	RTD 2 high alarm flag
112	RTD 2 high trip flag
113	RTD 2 low warning flag
114	RTD 2 low alarm flag
115	RTD 2 low trip flag
116	RTD 3 high warning flag
117	RTD 3 high alarm flag
118	RTD 3 high trip flag
119	RTD 3 low warning flag
120	RTD 3 low alarm flag
121	RTD 3 low trip flag
122	RTD 4 high warning flag
123	RTD 4 high alarm flag
124	RTD 4 high trip flag
125	RTD 4 low warning flag
126	RTD 4 low alarm flag
127	RTD 4 low trip flag
128	Analogue In 1 high warning flag
129	Analogue In 1 high alarm flag
130	Analogue In 1 high trip flag
131	Analogue In 1 low warning flag
132	Analogue In 1 low alarm flag
133	Analogue In 1 low trip flag
134	Analogue In 2 high warning flag
135	Analogue In 2 high alarm flag
136	Analogue In 2 high trip flag
137	Analogue In 2 low warning flag
138	Analogue In 2 low alarm flag
139	Analogue In 2 low trip flag
140	Analogue Out 1 high warning flag
141	Analogue Out 1 high alarm flag
142	Analogue Out 1 high trip flag
143	Analogue Out 1 low warning flag
144	Analogue Out 1 low alarm flag
145	Analogue Out 1 low trip flag

146	Analogue Out 2 high warning flag
147	Analogue Out 2 high alarm flag
148	Analogue Out 2 high trip flag
149	Analogue Out 2 low warning flag
150	Analogue Out 2 low alarm flag
151	Analogue Out 2 low trip flag
180	Starter Output 1
181	Starter Output 2
182	Starter Output 3
183	Starter Output 4
184	Starter Output 5
185	Pre Warning Flag
186	DC Break Flag
187	Transition Flag
188	Back Spin Flag

2.3.3 Function Flag Table 2

It is signals that can be routed to the inputs of the local and remote selection.

Address	Name
0	Constant Zero
1	Constant One
2	Field Input 1
3	Field Input 2
4	Field Input 3
5	Field Input 4
6	Field Input 5
7	Field Input 6
8	Field Input 7
9	Field Input 8
10	Field Input 9
11	Field Input 10
12	Field Input 11
13	Field Input 12
14	Field Input 13
15	Field Input 14
16	Field Input 15

17	PLC Input Bit 1
18	PLC Input Bit 2
19	PLC Input Bit 3
20	PLC Input Bit 4
21	PLC Input Bit 5
22	PLC Input Bit 6
23	PLC Input Bit 7
24	PLC Input Bit 8
25	PLC Input Bit 9
26	PLC Input Bit 10
27	PLC Input Bit 11
28	PLC Input Bit 12
29	PLC Input Bit 13
30	PLC Input Bit 14
31	PLC Input Bit 15
32	PLC Input Bit 16

2.3.4 Function Flag Table 3

It is signals that can be routed to the inputs of the starter logic starts, stops and interlock.

Address	Name
0	Constant Zero
1	Constant One
2	In Service Flag
3	Timer A Output
4	Inverted Timer A Output
5	Timer A Pulsed Output
6	Inverted Timer A Pulsed Output
7	Timer B Output
8	Inverted Timer B Output
9	Timer B Pulsed Output
10	Inverted Timer B Pulsed Output
11	RTC Output
12	Inverted RTC Output
13	Counter A Output
14	Inverted Counter A Output
15	Counter B Output
16	Inverted Counter B Output
17	Logical Function 1 Output
18	Inverted Logical Function 1 Output
19	Logical Function 2 Output
20	Inverted Logical Function 2 Output
21	Logical Function 3 Output
22	Inverted Logical Function 3 Output
23	Logical Function 4 Output
24	Inverted Logical Function 4 Output
25	Logical Function 5 Output
26	Inverted Logical Function 5 Output
27	Logical Function 6 Output
28	Inverted Logical Function 6 Output
29	Field Input 1
30	Field Input 2
31	Field Input 3
32	Field Input 4

33	Field Input 5
34	Field Input 6
35	Field Input 7
36	Field Input 8
37	Field Input 9
38	Field Input 10
39	Field Input 11
40	Field Input 12
41	Field Input 13
42	Field Input 14
43	Field Input 15
44	PLC Input Bit 1
45	PLC Input Bit 2
46	PLC Input Bit 3
47	PLC Input Bit 4
48	PLC Input Bit 5
49	PLC Input Bit 6
50	PLC Input Bit 7
51	PLC Input Bit 8
52	PLC Input Bit 9
53	PLC Input Bit 10
54	PLC Input Bit 11
55	PLC Input Bit 12
56	PLC Input Bit 13
57	PLC Input Bit 14
58	PLC Input Bit 15
59	PLC Input Bit 16

2.4 Structure Of The Acyclic Slot Map For NewCode

The following slots are available to Profibus DPV1 for class 1 and class 2 master:

SLOT / IOID	INDEX	NAME	DATA TYPE	RW
1 / #55	0 ~ 1	Reserved	W	RW
1 / #55	2	Maximum Load 0.	B	RW
1 / #55	3	Thermal Class Curve 0.	B	RW
1 / #55	4	Maximum Load 1.	B	RW
1 / #55	5	Thermal Class Curve 1.	B	RW
1 / #55	6	Relay Modal Number	B	RW
1 / #55	7	Reserved	B	RW
1 / #55	8~9	CT Primary	W	RW
1 / #55	10	CT secondary	B	RW
1 / #55	11	Voltage Selection. • 0 = 110 Vac. • 1 = 380 Vac. • 2 = 400 Vac. • 3 = 525 Vac. • 4 = 550 Vac. • 5 = 680 Vac. • 6 = 950 Vac. • 7 = 1K1 Vac. • 8 = 3K3 Vac. • 9 = 6K6 Vac. • 10 = 11K Vac.	B	RW
1 / #55	12	Volt Sym. Trip Level.	B	RW
1 / #55	13	Voltage High Limit	B	RW
1 / #55	14	Voltage Low Limit	B	RW
1 / #55	15	Unbalance Trip Level.	B	RW
1 / #55	16	Unbalance Trip Delay.	B	RW
1 / #55	17	ML Run Trip Delay.	B	RW
1 / #55	18	ML Start Up Trip Delay.	B	RW
1 / #55	19	ML Reset Timer. • 0 = Manual. • 1 = 10 Seconds.	B	RW

		• 2 = 5 Minutes. • 3 = 10 Minutes. • 4 = 20 Minutes. • 5 = 30 Minutes. • 6 = 45 Minutes. • 7 = 1 Hour. • 8 = 3 Hours. • 9 = 6 Hours.		
1 / #55	20	ML Trip Level.	B	RW
1 / #55	21	ML Power Factor Trip Level.	B	RW
1 / #55	22 ~ 23	EL Trip Level.	W	RW
1 / #55	24	EL Trip Type.	B	RW
1 / #55	25	Reserved	B	RW
1 / #55	26 ~ 27	EL Trip Time INST.	W	RW
1 / #55	28 ~ 29	Running Stall Trip Level.	W	RW
1 / #55	30	Running Stall Hold Off Time.	B	RW
1 / #55	31	Reserved	B	RW
1 / #55	32 ~ 33	Running Stall Trip Delay	W	RW
1 / #55	34	Thermal Class Reset Level.	B	RW
1 / #55	35	Starts Per Hour.	B	RW
1 / #55	36	Consecutive Starts.	B	RW
1 / #55	37	Reserved	B	RW
1 / #55	38	Control Byte A. • Bit 0 : Minimum Load Enabled. • Bit 1 : Under Voltage Enabled. • Bit 2 : Over Voltage Enabled. • Bit 3 : Voltage Symmetric Trip Enabled. • Bit 4 : Fail Safe Selected. • Bit 5 : Unbalance Trip Enabled. • Bit 6 : Phase Rotation Trip Enabled. • Bit 7 : Short Circuit Trip Enabled.	B	RW
1 / #55	39	Control Byte B. • Bit 0 : Single Phase Trip Enabled. • Bit 1 : Running Stall Trip Enabled. • Bit 2 : (0) Under Current Trip / (1) Power Factor Trip Enabled. • Bit 3 : Earth Leakage Trip Enabled. • Bit 4 : Low Pass Filter Enabled. • Bit 5 : Isolation Lockout Trip Enabled.	B	RW

		• Bit 6 : Frequency Trip Enabled. • Bit 7 : Thermal Auto Calculate Reset Enabled.		
1 / #55	40	Control Byte C. • Bit 0 : Starts Per Hour Enabled. • Bit 1 : Voltage Phase Rotation Reversed. • Bit 2 : Vectorial Stall Trip Enabled. • Bit 3 : Auto Thermal Reset Enabled. • Bit 4 : Relay 1 = (0) Main Trip Relay Enabled / (1) Mappable Relay. • Bit 5 : External I/O Connected. • Bit 6 : FLED Connected	B	RW
1 / #55	41	Control Byte D. • Bit 0 : RTD 1 Enabled. • Bit 1 : RTD 2 Enabled. • Bit 2 : RTD 3 Enabled. • Bit 3 : RTD 4 Enabled. • Bit 4 : Analogue In 1 Enabled. • Bit 5 : Analogue In 2 Enabled. • Bit 6 : Analogue Out 1 Enabled. • Bit 7 : Analogue Out 2 Enabled.	B	RW
1 / #55	42	Starter Type • 0 = Protection. • 1 = Direct On Line. • 2 = Reversal Direct On Line. • 3 = Star-Delta. • 4 = Reversal Star-Delta. • 5 = Dahlander. • 6 = Reversal Dahlander. • 7 = Pole Changing. • 8 = Reversal Pole Changing. • 9 = Soft Starter. • 10 = Reversal Soft Starter. • 11 = Oil Circuit Breaker Direct Online.	B	RW
1 / #55	43	RTD Type Bit 0 ~ 1 = RTD1 ➢ 00 = PT100 ➢ 01 = PT1000 ➢ 10 = PTC ➢ 11 = NTC Bit 2 ~ 4 = RTD2 ➢ 00 = PT100 ➢ 01 = PT1000 ➢ 10 = PTC	B	RW

		➢ 11 = NTC Bit 5 ~ 6 = RTD3 ➢ 00 = PT100 ➢ 01 = PT1000 ➢ 10 = PTC ➢ 11 = NTC Bit 7 ~ 8 = RTD 4 ➢ 00 = PT100 ➢ 01 = PT1000 ➢ 10 = PTC ➢ 11 = NTC		
1 / #55	44~45	Field Input 1 Delay	W	RW
1 / #55	46~47	Field Input 2 Delay	W	RW
1 / #55	48~49	Field Input 3 Delay	W	RW
1 / #55	50~51	Field Input 4 Delay	W	RW
1 / #55	52~53	Field Input 5 Delay	W	RW
1 / #55	54~55	Field Input 6 Delay	W	RW
1 / #55	56~57	Field Input 7 Delay	W	RW
1 / #55	58~59	Field Input 8 Delay	W	RW
1 / #55	60~61	Field Input 9 Delay	W	RW
1 / #55	62~63	Field Input 10 Delay	W	RW
1 / #55	64~65	Field Input 11 Delay	W	RW
1 / #55	66~67	Field Input 12 Delay	W	RW
1 / #55	68~69	Field Input 13 Delay	W	RW
1 / #55	70~71	Field Input 14 Delay	W	RW
1 / #55	72~73	Field Input 15 Delay	W	RW
1 / #55	74	RTD 1 High Trip Level	B	RW
1 / #55	75	RTD 1 High Alarm Level	B	RW
1 / #55	76	RTD 1 Low Alarm Level	B	RW
1 / #55	77	RTD 1 Low Trip Level	B	RW
1 / #55	78	RTD 2 High Trip Level	B	RW
1 / #55	79	RTD 2 High Alarm Level	B	RW
1 / #55	80	RTD 2 Low Alarm Level	B	RW
1 / #55	81	RTD 2 Low Trip Level	B	RW
1 / #55	82	RTD 3 High Trip Level	B	RW
1 / #55	83	RTD 3 High Alarm Level	B	RW

1 / #55	84	RTD 3 Low Alarm Level	B	RW
1 / #55	85	RTD 3 Low Trip Level	B	RW
1 / #55	86	RTD 4 High Trip Level	B	RW
1 / #55	87	RTD 4 High Alarm Level	B	RW
1 / #55	88	RTD 4 Low Alarm Level	B	RW
1 / #55	89	RTD 4 Low Trip Level	B	RW
1 / #55	90	Analogue In 1 High Trip Level	B	RW
1 / #55	91	Analogue In 1 High Alarm Level	B	RW
1 / #55	92	Analogue In 1 Low Alarm Level	B	RW
1 / #55	93	Analogue In 1 Low Trip Level	B	RW
1 / #55	94	Analogue In 2 High Trip Level	B	RW
1 / #55	95	Analogue In 2 High Alarm Level	B	RW
1 / #55	96	Analogue In 2 Low Alarm Level	B	RW
1 / #55	97	Analogue In 2 Low Trip Level	B	RW
1 / #55	98	Analogue Out 1 High Trip Level	B	RW
1 / #55	99	Analogue Out 1 High Alarm Level	B	RW
1 / #55	100	Analogue Out 1 Low Alarm Level	B	RW
1 / #55	101	Analogue Out 1 Low Trip Level	B	RW
1 / #55	102	Analogue Out 2 High Trip Level	B	RW
1 / #55	103	Analogue Out 2 High Alarm Level	B	RW
1 / #55	104	Analogue Out 2 Low Alarm Level	B	RW
1 / #55	105	Analogue Out 2 Low Trip Level	B	RW
1 / #55	106	Logic Function 1 Output Table.	B	RW
1 / #55	107	Logic Function 1 Input A. (See Chapter 2.3.2).	B	RW
1 / #55	108	Logic Function 1 Input B. (See Chapter 2.3.2).	B	RW
1 / #55	109	Logic Function 1 Input C. (See Chapter 2.3.2).	B	RW
1 / #55	110	Logic Function 2 Output Table.	B	RW
1 / #55	111	Logic Function 2 Input A. (See Chapter 2.3.2).	B	RW
1 / #55	112	Logic Function 2 Input B. (See Chapter 2.3.2).	B	RW
1 / #55	113	Logic Function 2 Input C. (See Chapter 2.3.2).	B	RW
1 / #55	114	Logic Function 3 Output Table.	B	RW
1 / #55	115	Logic Function 3 Input A. (See Chapter 2.3.2).	B	RW
1 / #55	116	Logic Function 3 Input B. (See Chapter 2.3.2).	B	RW

1 / #55	117	Logic Function 3 Input C. (See Chapter 2.3.2).	B	RW
1 / #55	118	Logic Function 4 Output Table.	B	RW
1 / #55	119	Logic Function 4 Input A. (See Chapter 2.3.2).	B	RW
1 / #55	120	Logic Function 4 Input B. (See Chapter 2.3.2).	B	RW
1 / #55	121	Logic Function 4 Input C. (See Chapter 2.3.2).	B	RW
1 / #55	122	Logic Function 5 Output Table.	B	RW
1 / #55	123	Logic Function 5 Input A. (See Chapter 2.3.2).	B	RW
1 / #55	124	Logic Function 5 Input B. (See Chapter 2.3.2).	B	RW
1 / #55	125	Logic Function 5 Input C. (See Chapter 2.3.2).	B	RW
1 / #55	126	Logic Function 6 Output Table.	B	RW
1 / #55	127	Logic Function 6 Input A. (See Chapter 2.3.2).	B	RW
1 / #55	128	Logic Function 6 Input B. (See Chapter 2.3.2).	B	RW
1 / #55	129	Logic Function 6 Input C. (See Chapter 2.3.2).	B	RW
1 / #55	130 ~ 131	Timer A Time Out.	W	RW
1 / #55	132	Timer A Start Input. (See Chapter 2.3.2).	B	RW
1 / #55	133	Timer A Reset Input. (See Chapter 2.3.2).	B	RW
1 / #55	134 ~135	Timer B Time Out.	W	RW
1 / #55	136	Timer B Start Input. (See Chapter 2.3.2).	B	RW
1 / #55	137	Timer B Stop Input. (See Chapter 2.3.2).	B	RW
1 / #55	138	Counter A Limit.	B	RW
1 / #55	139	Counter A Count Up Input. (See Chapter 2.3.2).	B	RW
1 / #55	140	Counter A Count Down Input. (See Chapter 2.3.2).	B	RW
1 / #55	141	Counter A Reset Input. (See Chapter 2.3.2).	B	RW
1 / #55	142	Counter B Limit.	B	RW
1 / #55	143	Counter B Count Up Input. (See Chapter 2.3.2).	B	RW
1 / #55	144	Counter B Count Down Input. (See Chapter 2.3.2).	B	RW
1 / #55	145	Counter B Reset Input. (See Chapter 2.3.2).	B	RW
1 / #55	146	Status Reporter Input. (See Chapter 2.3.2).	B	RW
1 / #55	147	Latch A Set Input. (See Chapter 2.3.2).	B	RW
1 / #55	148	Latch A Reset Input. (See Chapter 2.3.2).	B	RW
1 / #55	149	Latch B Set Input. (See Chapter 2.3.2).	B	RW
1 / #55	150	Latch B Reset Input. (See Chapter 2.3.2).	B	RW

1 / #55	151	Pulse Generator Input. (See Chapter 2.3.2).	B	RW
1 / #55	152	Pulse Generator Period	B	RW
1 / #55	153	Pulse Generator Duty Cycles.	B	RW
1 / #55	154	RTC Hour Start Time.	B	RW
1 / #55	155	RTC Minute Start Time.	B	RW
1 / #55	156	RTC Hour Stop Time.	B	RW
1 / #55	157	RTC Minute Stop Time.	B	RW
1 / #55	158	Relay 1 Input. (See Chapter 2.3.2).	B	RW
1 / #55	159	Relay 2 Input. (See Chapter 2.3.2).	B	RW
1 / #55	160	Relay 3 Input. (See Chapter 2.3.2).	B	RW
1 / #55	161	Relay 4 Input. (See Chapter 2.3.2).	B	RW
1 / #55	162	Relay 5 Input. (See Chapter 2.3.2).	B	RW
1 / #55	163	Relay 6 Input. (See Chapter 2.3.2).	B	RW
1 / #55	164	Relay 7 Input. (See Chapter 2.3.2).	B	RW
1 / #55	165	Relay 8 Input. (See Chapter 2.3.2).	B	RW
1 / #55	166	Reset Input. (See Chapter 2.3.2).	B	RW
1 / #55	167	TC Warning Level	B	RW
1 / #55	168	Local Remote lsb. (See Chapter 2.3.3).	B	RW
1 / #55	169	Local Remote msb. (See Chapter 2.3.3).	B	RW
1 / #55	170	Local Start Forward Fast. (See Chapter 2.3.4).	B	RW
1 / #55	171	Local Start Forward Slow (See Chapter 2.3.4).	B	RW
1 / #55	172	Local Start Reverse Fast (See Chapter 2.3.4).	B	RW
1 / #55	173	Local Start Reverse Slow (See Chapter 2.3.4).	B	RW
1 / #55	174	Local Interlock (See Chapter 2.3.4).	B	RW
1 / #55	175	Local Stop (See Chapter 2.3.4).	B	RW
1 / #55	176	Remote Start Forward Fast (See Chapter 2.3.4).	B	RW
1 / #55	177	Remote Start Forward Slow (See Chapter 2.3.4).	B	RW
1 / #55	178	Remote Start Reverse Fast (See Chapter 2.3.4).	B	RW
1 / #55	179	Remote Start Reverse Slow (See Chapter 2.3.4).	B	RW
1 / #55	180	Remote Interlock (See Chapter 2.3.4).	B	RW
1 / #55	181	Remote Stop (See Chapter 2.3.4).	B	RW
1 / #55	182	Auto Start Forward Fast (See Chapter 2.3.4).	B	RW
1 / #55	183	Auto Start Forward Slow (See Chapter 2.3.4).	B	RW

1 / #55	184	Auto Start Reverse Fast (See Chapter 2.3.4).	B	RW
1 / #55	185	Auto Start Reverse Slow (See Chapter 2.3.4).	B	RW
1 / #55	186	Auto Interlock (See Chapter 2.3.4).	B	RW
1 / #55	187	Auto Stop (See Chapter 2.3.4).	B	RW
1 / #55	188	Feedback Signal Input (See Chapter 2.3.4).	B	RW
1 / #55	189	Reserved	B	RW
1 / #55	190 ~ 191	Pre Start Warning Timer	W	RW
1 / #55	192	Execution Timer	B	RW
1 / #55	193	Reserved	B	
1 / #55	194 ~ 195	Feedback Timer	W	RW
1 / #55	196 ~ 197	Back Spin Timer	W	RW
1 / #55	198 ~ 199	DC Break Timer	W	RW
1 / #55	200 ~ 201	Restart Timer	W	RW
1 / #55	202 ~ 203	Star Maximum Timer	W	RW
1 / #55	204 ~ 205	Transition Timer	W	RW
1 / #55	206 ~ 207	Frozen Contact Timer	W	RW
1 / #55	208 ~ 209	Start-up Counter	W	RW
1 / #55	210 ~ 211	Trip Counter	W	RW
1 / #55	212 ~ 213	Motor Total Running Hour Counter	W	RW
1 / #55	214 ~ 215	Motor Full Load Running Hour Counter	W	RW
1 / #55	216 ~ 217	Relay Running Hour Counter	W	RW
1 / #55	218 ~ 219	Apparent Power Consumption	W	RW
1 / #55	220 ~ 221	Real Power Consumption	W	RW

1 / #55	222	Start up year	B	R
1 / #55	223	Start up month	B	R
1 / #55	224	Start up day	B	R
1 / #55	225	Start up hour	B	R
1 / #55	226	Start up minutes	B	R
2 / #54	0	Thermal Capacity Remaining	B	R
2 / #54	1	Reserved	B	R
2 / #54	2 ~ 3	Current Level.	W	R
2 / #54	4 ~ 5	Red Phase Current Level.	W	R
2 / #54	6 ~ 7	White Phase Current Level.	W	R
2 / #54	8 ~ 9	Blue Phase Current Level.	W	R
2 / #54	10 ~ 11	Voltage Line Level.	W	R
2 / #54	12 ~ 13	Red Phase Voltage Level.	W	R
2 / #54	14 ~ 15	White Phase Voltage Level.	W	R
2 / #54	16 ~ 17	Blue Phase Voltage Level.	W	R
2 / #54	18	Unbalance Level.	B	R
2 / #54	19	Voltage Symmetric Level.	B	R
2 / #54	20 ~ 21	Earth Leakage Level.	W	R
2 / #54	22	Power Factor Level.	B	R
2 / #54	23	Frequency Level.	B	R
2 / #54	24 ~ 25	Insulation Level.	W	R
2 / #54	26	Current MLC setting	B	R
2 / #54	27	Current TC setting	B	R
2 / #54	28	RTD 1 Level	B	R
2 / #54	29	RTD 2 Level	B	R
2 / #54	30	RTD 3 Level	B	R
2 / #54	31	RTD 4 Level	B	R
2 / #54	32	Analogue In 1 Level	B	R
2 / #54	33	Analogue In 2 Level	B	R
2 / #54	34	Analogue Out 1 Level	B	R
2 / #54	35	Analogue Out 2 Level	B	R
2 / #54	36 ~ 37	Alarm Flags A. • Bit 0 = In Service. • Bit 1 = Earth Leakage.	W	R

		• Bit 2 = Over Current. • Bit 3 = Running Stall. • Bit 4 = Unbalance. • Bit 5 = Single Phase. • Bit 6 = Minimum Load. • Bit 7 = Short Circuit. • Bit 8 = Voltage Present. • Bit 9 = Over Voltage. • Bit 10 = Under Voltage. • Bit 11 = Voltage Symmetric. • Bit 12 = Insulation Lock Out. • Bit 13 = Low Frequency. • Bit 14 = High Frequency. • Bit 15 = Earth Fault.		
2 / #54	38 ~ 39	Alarm Flags B. • Bit 0 = Vectorial Stall. • Bit 1 = Frozen Contact. • Bit 2 ~ 7 = Reserved. • Bit 8 = RTD 1 Hi. • Bit 9 = RTD 1 Lo. • Bit 10 = RTD 2 Hi. • Bit 11 = RTD 2 Lo. • Bit 12 = RTD 3 Hi. • Bit 13 = RTD 3 Lo. • Bit 14 = RTD 4 Hi. • Bit 15 = RTD 4 Lo.	W	R
2 / #54	40 ~ 41	Alarm Flags C. • Bit 0 = Analogue In 1 Hi. • Bit 1 = Analogue In 1 Lo. • Bit 2 = Analogue In 2 Hi. • Bit 3 = Analogue In 2 Lo. • Bit 4 = Analogue Out 1 Hi. • Bit 5 = Analogue Out 1 Lo. • Bit 6 = Analogue Out 2 Hi. • Bit 7 = Analogue Out 2 Lo. • Bit 8 ~ 15 = Reserved	W	R
2 / #54	42 ~ 43	Trip Flags A. • Bit 0 = Over Current. • Bit 1 = Running Stall. • Bit 2 = Unbalance. • Bit 3 = Single Phase. • Bit 4 = Minimum Load. • Bit 5 = Short Circuit. • Bit 6 = Phase Rotation.	W	R

		• Bit 7 = Earth Leakage. • Bit 8 = Over Voltage. • Bit 9 = Under Voltage. • Bit 10 = Voltage Symmetric. • Bit 11 = Insulation Lock Out. • Bit 12 = Low Frequency. • Bit 13 = High Frequency. • Bit 14 = Earth Fault. • Bit 15 = Starts Per Hour.		
2 / #54	44 ~ 45	Trip Flags B. • Bit 0 = System Failure. • Bit 1 = Vectorial Stall. • Bit 2 = Frozen Contact. • Bit 3 = Execution. • Bit 4 = Feedback. • Bit 5 = Unauthorized Current. • Bit 6 ~ 7 = Reserved. • Bit 8 = RTD 1 Hi. • Bit 9 = RTD 1 Lo. • Bit 10 = RTD 2 Hi. • Bit 11 = RTD 2 Lo. • Bit 12 = RTD 3 Hi. • Bit 13 = RTD 3 Lo. • Bit 14 = RTD 4 Hi. • Bit 15 = RTD 4 Lo.	W	R
2 / #54	46 ~ 47	Trip Flags C. • Bit 0 = Analogue In 1 Hi. • Bit 1 = Analogue In 1 Lo. • Bit 2 = Analogue In 2 Hi. • Bit 3 = Analogue In 2 Lo. • Bit 4 = Analogue Out 1 Hi. • Bit 5 = Analogue Out 1 Lo. • Bit 6 = Analogue Out 2 Hi. • Bit 7 = Analogue Out 2 Lo. • Bit 8 ~ 15 = Reserved.	W	R
2 / #54	48 ~ 49	Warning Flags • Bit 0 = RTD 1 Hi. • Bit 1 = RTD 1 Lo. • Bit 2 = RTD 2 Hi. • Bit 3 = RTD 2 Lo. • Bit 4 = RTD 3 Hi. • Bit 5 = RTD 3 Lo. • Bit 6 = RTD 4 Hi.	W	

		• Bit 7 = RTD 4 Lo. • Bit 8 = Analogue In 1 Hi. • Bit 9 = Analogue In 1 Lo. • Bit 10 = Analogue In 2 Hi. • Bit 11 = Analogue In 2 Lo. • Bit 12 = Analogue Out 1 Hi. • Bit 13 = Analogue Out 1 Lo. • Bit 14 = Analogue Out 2 Hi. • Bit 15 = Analogue Out 2 Lo.		
2 / #54	50 ~ 51	Function Status Word 0. • Bit 0 = Logic Function 1 Output. • Bit 1 = Logic Function 2 Output. • Bit 2 = Logic Function 3 Output. • Bit 3 = Logic Function 4 Output. • Bit 4 = Logic Function 5 Output. • Bit 5 = Logic Function 6 Output. • Bit 6 = Simulation Active. • Bit 7 = Counter B Output. • Bit 8 = Timer A Output. • Bit 9 = Timer B Output. • Bit 10 = Real Time Clock Output. • Bit 11 = Relay 1 Output. • Bit 12 = Relay 2 Output. • Bit 13 = Relay 3 Output. • Bit 14 = Relay 4 Output. • Bit 15 = Counter A Output.	W	R
2 / #54	52 ~ 53	Function Status Word 1. • Bit 0 = Field Input 1. • Bit 1 = Field Input 2. • Bit 2 = Field Input 3. • Bit 3 = Field Input 4. • Bit 4 = Field Input 5. • Bit 5 = Field Input 6. • Bit 6 = Field Input 7. • Bit 7 = Reserved. • Bit 8 = Starter Output 1. • Bit 9 = Starter Output 2. • Bit 10 = Starter Output 3. • Bit 11 = Starter Output 4. • Bit 12 = Starter Output 5. • Bit 13 = Reserved. • Bit 14 = Local Select Bit lsb. • Bit 15 = Local Select Bit msb.	W	R

2 / #54	54 ~ 55	Function Status Word 2. • Bit 0 = PLC Input Bit 1. • Bit 1 = PLC Input Bit 2. • Bit 2 = PLC Input Bit 3. • Bit 3 = PLC Input Bit 4. • Bit 4 = PLC Input Bit 5. • Bit 5 = PLC Input Bit 6. • Bit 6 = PLC Input Bit 7. • Bit 7 = PLC Input Bit 8. • Bit 8 = PLC Input Bit 9. • Bit 9 = PLC Input Bit 10. • Bit 10 = PLC Input Bit 11. • Bit 11 = PLC Input Bit 12. • Bit 12 = PLC Input Bit 13. • Bit 13 = PLC Input Bit 14. • Bit 14 = PLC Input Bit 15. • Bit 15 = PLC Input Bit 16.	W	R
2 / #54	56 ~ 57	Function Status Word 3. • Bit 0 = Timer A Pulse Output. • Bit 1 = Timer B Pulse Output. • Bit 2 = Status Reporter Output. • Bit 3 = Latch Output A. • Bit 4 = Relay 5. • Bit 5 = Relay 6. • Bit 6 = Relay 7. • Bit 7 = Relay 8. • Bit 8 = Pre Start warning Signal. • Bit 9 = DC breaker Active. • Bit 10 = Transition Active. • Bit 11 = Backspin Active. • Bit 12 = Reserved. • Bit 13 = Latch Output B. • Bit 14 = Reserved. • Bit 15 = TC warning level.	W	R
2 / #54	58 ~ 59	Function Status Word 4. • Bit 0 = Field Input 8. • Bit 1 = Field Input 9. • Bit 2 = Field Input 10. • Bit 3 = Field Input 11. • Bit 4 = Field Input 12. • Bit 5 = Field Input 13. • Bit 6 = Field Input 14. • Bit 7 = Field Input 15.	W	R

		• Bit 8~15 = Reserved.		
2 / #54	60	Counter A Value.	B	R
2 / #54	61	Counter B Value.	B	R
2 / #54	62	Profibus DP Address.	B	R
2 / #54	63	Communication Module Status 0. • Bit 0 to 3 = Baud rate. ◦ 0000 = 12 Mbit/s. ◦ 0001 = 6 Mbit/s. ◦ 0010 = 3 Mbit/s. ◦ 0011 = 1,5 Mbit/s. ◦ 0100 = 500 Kbit/s. ◦ 0101 = 187,5 Kbit/s. ◦ 0110 = 93,75 Kbit/s. ◦ 0111 = 45,45 Kbit/s. ◦ 1000 = 19,2 Kbit/s. ◦ 1001 = 9,6 Kbit/s. ◦ 1111 = Baud rate not detected. • Bit 4 to 7 = Chip Revision. ◦ 0000 = Revision A. ◦ 1011 = Revision B. ◦ 1100 = Revision C. ◦ 1101 = Revision D.	B	R
2 / #54	64	Communication Module Status 1. • Bit 0 to 3 = Reserved. • Bit 4 and 5 = DP State Machine. ◦ 00 = Waiting for parameters. ◦ 01 = Waiting for configurations. ◦ 10 = Data exchange. • Bit 6 and 7 = Watch Dog State Machine. ◦ 00 = Baud search. ◦ 01 = Baud control. ◦ 10 = DP control.	B	R
2 / #54	65	Reserved	B	R
2 / #54	66 ~ 67	Cyclic Time.	W	R
2 / #54	68	Cyclic Time Positive Deviation.	B	R
2 / #54	69	Reserved	B	R
2 / #54	70	Cyclic Time Negative Deviation.	B	R
2 / #54	71	Reserved	B	R
2 / #54	72	Fault 1 Status Byte - 0 = Actual Trip	B	R

		- 1 = Simulated Trip		
2 / #54	73 ~ 75	Fault 1 Date Byte 1 = Year Byte 2 = Month Byte 3 = Day	B	R
2 / #54	76 ~ 77	Fault 1 Time Byte 4 = HH Byte 5 = MM	B	R
2 / #54	78 ~ 79	Trip Flags A	W	R
2 / #54	80 ~ 81	Trip Flags B	W	R
2 / #54	82 ~ 83	Trip Flags C	W	
2 / #54	84 ~ 85	Motor Running Hour Counter	W	R
2 / #54	86 ~ 87	Maximum Current Level in %	W	R
2 / #54	88 ~ 89	Maximum Voltage Level	W	R
2 / #54	90 ~ 91	Breaker Clear Timer in ms	W	R
2 / #54	92	Fault 2 Status Byte - 0 = Actual Trip - 1 = Simulated Trip	B	R
2 / #54	93 ~ 95	Fault 2 Date Byte 21 = Year Byte 22 = Month Byte 23 = Day	B	R
2 / #54	96 ~ 97	Fault 2 Time Byte 24 = HH Byte 25 = MM	B	R
2 / #54	98 ~ 99	Trip Flags A	W	R
2 / #54	100 ~ 101	Trip Flags B	W	R
2 / #54	102 ~ 103	Trip Flags C	W	R
2 / #54	104 ~ 105	Motor Running Hour Counter	W	R
2 / #54	106 ~ 107	Maximum Current Level in %	W	R
2 / #54	108 ~ 109	Maximum Voltage Level	W	R
2 / #54	110 ~ 111	Breaker Clear Timer in ms	W	R

2 / #54	112	Fault 3 Status Byte - 0 = Actual Trip - 1 = Simulated Trip	B	R
2 / #54	113 ~ 115	Fault 3 Date Byte 41 = Year Byte 42 = Month Byte 43 = Day	B	R
2 / #54	116 ~ 117	Fault 3 Time Byte 44 = HH Byte 45 = MM	B	R
2 / #54	118 ~ 119	Trip Flags A	W	R
2 / #54	120 ~ 121	Trip Flags B	W	R
2 / #54	122 ~ 123	Trip Flags C	W	R
2 / #54	124 ~ 125	Motor Running Hour Counter	W	R
2 / #54	126 ~ 127	Maximum Current Level in %	W	R
2 / #54	128 ~ 129	Maximum Voltage Level	W	R
2 / #54	130 ~ 131	Breaker Clear Timer in ms	W	R
2 / #54	132	Fault 4 Status Byte - 0 = Actual Trip - 1 = Simulated Trip	B	R
2 / #54	133 ~ 135	Fault 4 Date Byte 61 = Year Byte 62 = Month Byte 63 = Day	B	R
2 / #54	136 ~ 137	Fault 4 Time Byte 64 = HH Byte 65 = MM	B	R
2 / #54	138 ~ 139	Trip Flags A	W	R
2 / #54	140 ~ 141	Trip Flags B	W	R
2 / #54	142 ~ 143	Trip Flags C	W	R

2 / #54	144 ~ 145	Motor Running Hour Counter	W	R
2 / #54	146 ~ 147	Maximum Current Level in %	W	R
2 / #54	148 ~ 149	Maximum Voltage Level	W	R
2 / #54	150 ~ 151	Breaker Clear Timer in ms	W	R
2 / #54	152	Fault 5 Status Byte - 0 = Actual Trip - 1 = Simulated Trip	B	R
2 / #54	153 ~ 155	Fault 5 Date Byte 81 = Year Byte 82 = Month Byte 83 = Day	B	R
2 / #54	156 ~ 157	Fault 5 Time Byte 84 = HH Byte 85 = MM	B	R
2 / #54	158 ~ 159	Trip Flags A	W	R
2 / #54	160 ~ 161	Trip Flags B	W	R
2 / #54	162 ~ 163	Trip Flags C	W	R
2 / #54	164 ~ 165	Motor Running Hour Counter	W	R
2 / #54	166 ~ 167	Maximum Current Level in %	W	R
2 / #54	168 ~ 169	Maximum Voltage Level	W	R
2 / #54	170 ~ 171	Breaker Clear Timer in ms	W	R

2.5 Diagnostics For NewCode

Diagnostic message will look as follow:

Byte	Description
0 ~ 2	Station status as per DP specifications.
3	Master profibus address.
4 ~ 5	Manufacture ID.
6 ~ 7	Diagnostic identification and length.
8	Protection Flags Information Length
9	Protection Flags Information ID.
10	Slot number.
11	Index
12 ~ 13	Trip Flags A. • Bit 0 = Over Current. • Bit 1 = Running Stall. • Bit 2 = Unbalance. • Bit 3 = Single Phase. • Bit 4 = Minimum Load. • Bit 5 = Short Circuit. • Bit 6 = Phase Rotation. • Bit 7 = Earth Leakage. • Bit 8 = Over Voltage. • Bit 9 = Under Voltage. • Bit 10 = Voltage Symmetric. • Bit 11 = Insulation Lock Out. • Bit 12 = Low Frequency. • Bit 13 = High Frequency. • Bit 14 = Earth Fault. • Bit 15 = Starts Per Hour.
14 ~ 15	Trip Flags B. • Bit 0 = System Failure. • Bit 1 = Vectorial Stall. • Bit 2 = Frozen Contact. • Bit 3 = Execution. • Bit 4 = Feedback. • Bit 5 = Unauthorized Current. • Bit 6 ~ 7 = Reserved. • Bit 8 = RTD 1 Hi. • Bit 9 = RTD 1 Lo.

	• Bit 10 = RTD 2 Hi. • Bit 11 = RTD 2 Lo. • Bit 12 = RTD 3 Hi. • Bit 13 = RTD 3 Lo. • Bit 14 = RTD 4 Hi. • Bit 15 = RTD 4 Lo.
16 ~ 17	Trip Flags C. • Bit 0 = Analogue In 1 Hi. • Bit 1 = Analogue In 1 Lo. • Bit 2 = Analogue In 2 Hi. • Bit 3 = Analogue In 2 Lo. • Bit 4 = Analogue Out 1 Hi. • Bit 5 = Analogue Out 1 Lo. • Bit 6 = Analogue Out 2 Hi. • Bit 7 = Analogue Out 2 Lo. • Bit 8 ~ 15 = Reserved.
18 ~ 19	Alarm Flags A. • Bit 0 = In Service. • Bit 1 = Earth Leakage. • Bit 2 = Over Current. • Bit 3 = Running Stall. • Bit 4 = Unbalance. • Bit 5 = Single Phase. • Bit 6 = Minimum Load. • Bit 7 = Short Circuit. • Bit 8 = Voltage Present. • Bit 9 = Over Voltage. • Bit 10 = Under Voltage. • Bit 11 = Voltage Symmetric. • Bit 12 = Insulation Lock Out. • Bit 13 = Low Frequency. • Bit 14 = High Frequency. • Bit 15 = Earth Fault.
20 ~ 21	Alarm Flags B. • Bit 0 = Vectorial Stall. • Bit 1 = Frozen Contact. • Bit 2 ~ 7 = Reserved. • Bit 8 = RTD 1 Hi. • Bit 9 = RTD 1 Lo. • Bit 10 = RTD 2 Hi. • Bit 11 = RTD 2 Lo. • Bit 12 = RTD 3 Hi.

	• Bit 13 = RTD 3 Lo. • Bit 14 = RTD 4 Hi. • Bit 15 = RTD 4 Lo.
22 ~ 23	Alarm Flags C. • Bit 0 = Analogue In 1 Hi. • Bit 1 = Analogue In 1 Lo. • Bit 2 = Analogue In 2 Hi. • Bit 3 = Analogue In 2 Lo. • Bit 4 = Analogue Out 1 Hi. • Bit 5 = Analogue Out 1 Lo. • Bit 6 = Analogue Out 2 Hi. • Bit 7 = Analogue Out 2 Lo. • Bit 8 ~ 15 = Reserved
24	Logic Flags Length
25	Logic Flags ID
26	Slot number
27	Index
28 ~ 29	Function Status Word 0. • Bit 0 = Logic Function 1 Output. • Bit 1 = Logic Function 2 Output. • Bit 2 = Logic Function 3 Output. • Bit 3 = Logic Function 4 Output. • Bit 4 = Logic Function 5 Output. • Bit 5 = Logic Function 6 Output. • Bit 6 = Simulation Active. • Bit 7 = Counter B Output. • Bit 8 = Timer A Output. • Bit 9 = Timer B Output. • Bit 10 = Real Time Clock Output. • Bit 11 = Relay 1 Output. • Bit 12 = Relay 2 Output. • Bit 13 = Relay 3 Output. • Bit 14 = Relay 4 Output. • Bit 15 = Counter A Output.
30 ~ 31	Function Status Word 1. • Bit 0 = Field Input 1. • Bit 1 = Field Input 2. • Bit 2 = Field Input 3. • Bit 3 = Field Input 4. • Bit 4 = Field Input 5. • Bit 5 = Field Input 6.

	• Bit 6 = Field Input 7. • Bit 7 = Reserved. • Bit 8 = Starter Output 1. • Bit 9 = Starter Output 2. • Bit 10 = Starter Output 3. • Bit 11 = Starter Output 4. • Bit 12 = Starter Output 5. • Bit 13 = Reserved. • Bit 14 = Local Select Bit lsb. • Bit 15 = Local Select Bit msb.
32 ~ 33	Function Status Word 2. • Bit 0 = PLC Input Bit 1. • Bit 1 = PLC Input Bit 2. • Bit 2 = PLC Input Bit 3. • Bit 3 = PLC Input Bit 4. • Bit 4 = PLC Input Bit 5. • Bit 5 = PLC Input Bit 6. • Bit 6 = PLC Input Bit 7. • Bit 7 = PLC Input Bit 8. • Bit 8 = PLC Input Bit 9. • Bit 9 = PLC Input Bit 10. • Bit 10 = PLC Input Bit 11. • Bit 11 = PLC Input Bit 12. • Bit 12 = PLC Input Bit 13. • Bit 13 = PLC Input Bit 14. • Bit 14 = PLC Input Bit 15. • Bit 15 = PLC Input Bit 16.
34 ~ 35	Function Status Word 3. • Bit 0 = Timer A Pulse Output. • Bit 1 = Timer B Pulse Output. • Bit 2 = Status Reporter Output. • Bit 3 = Latch Output. • Bit 4 = Relay 5. • Bit 5 = Relay 6. • Bit 6 = Relay 7. • Bit 7 = Relay 8. • Bit 8 = Pre Start warning Signal. • Bit 9 = DC breaker Active. • Bit 10 = Transition Active. • Bit 11 = Backspin Active. • Bit 12 ~ 14 = Reserved. • Bit 15 = TC warning level.

36 ~ 37	Function Status Word 4. • Bit 0 = Field Input 8. • Bit 1 = Field Input 9. • Bit 2 = Field Input 10. • Bit 3 = Field Input 11. • Bit 4 = Field Input 12. • Bit 5 = Field Input 13. • Bit 6 = Field Input 14. • Bit 7 = Field Input 15. • Bit 8~15 = Reserved.
38 ~ 39	Warning Flags • Bit 0 = RTD 1 Hi. • Bit 1 = RTD 1 Lo. • Bit 2 = RTD 2 Hi. • Bit 3 = RTD 2 Lo. • Bit 4 = RTD 3 Hi. • Bit 5 = RTD 3 Lo. • Bit 6 = RTD 4 Hi. • Bit 7 = RTD 4 Lo. • Bit 8 = Analogue In 1 Hi. • Bit 9 = Analogue In 1 Lo. • Bit 10 = Analogue In 2 Hi. • Bit 11 = Analogue In 2 Lo. • Bit 12 = Analogue Out 1 Hi. • Bit 13 = Analogue Out 1 Lo. • Bit 14 = Analogue Out 2 Hi. • Bit 15 = Analogue Out 2 Lo.

2.6 Structure Of The Parametrization Telegram For MA-Relay

The parametrization telegram data will look as follow:

Byte Addr	Parameter Name	Description	Range
0	Reserved		Set
1	MLC	Maximum load setting in %.	10 ~ 100
2	Minimum load level	Minimum load level in % to trip at. Multiplier 4.	5 ~ 25
3	Thermal Curve Class	Thermal curve class .	5 ~ 35
4	EL trip level	Earth leakage trip level. Multiplier 10.	25~100
5	EL trip delay	Earth leakage trip delay. Multiplier 50.	2~40
6	Control Byte A	Control byte. • Bit 0 : Auto manual. • Bit 1 : Minimum load disabled. • Bit 2 : Minimum load auto reset. • Bit 3 : Under voltage disabled. • Bit 4 : Fail safe disabled. • Bit 5 : Unbalance disabled. • Bit 6 : Phase rotation disabled. • Bit 7 : Running stall disabled.	0~255
7	Control Byte B	Control byte. • Bit 0 : Earth leakage disabled. • Bit 1 : RTD 1 disabled. • Bit 2 : RTD 2 disabled. • Bit 3 : RTD 3 disabled. • Bit 4 : Over voltage disabled. • Bit 5 : Single phase disabled. • Bit 6 : Earth leakage filter disabled. • Bit 7 : Reserved.	0~255
8	Volt Selection	Voltage line input level selector. • 0 = 0 Vac. (NC will see as 380Vac) • 1 = 110 Vac. • 2 = 380 Vac. • 3 = 525 Vac.	0~3
9	PTC trip delay	Thermal trip delay. Multiplier 0.05	20~200
10	Unbalance trip level	Unbalance trip level in %.	5 ~ 50
11	Unbalance trip delay	Unbalance trip delay. Multiplier 0.05	20 ~ 200
12	PTC trip level	Thermals trip level. Multiplier 20	5~255

13	Minimum load trip delay	Delay for minimum load. Multiplier 0.05	20~200
14	ML Reset Timer.	Time it will take to reset relay after trip. • 0 = Manual. • 1 = 10 Seconds. • 2 = 5 Minutes. • 3 = 10 Minutes. • 4 = 20 Minutes. • 5 = 30 Minutes. • 6 = 45 Minutes. • 7 = 1 Hour. • 8 = 3 Hours. • 9 = 6 Hours.	0 ~ 9
15	Initialized TC	TC initialized level	0 ~ 100

2.7 Structure Of The Cyclic For MA-Relay

The cyclic data out of the NewCode as a MA-Relay will look as follow:

Cyclic Data Out (From PLC)		
Byte , Bit	**Parameter**	**Description**
Byte 0 , 0	Reserved	
Byte 0 , 1	Relay 2	Controls relay 2
Byte 0 , 2	Relay 3	Controls relay 3
Byte 0 , 3	Reserved	
Byte 0 , 4	PLC Control Bit 0	If all bits are set then PLC has control over relay 2 and 3 of the NewCode
Byte 0 , 5	PLC Control Bit 1	
Byte 0 , 6	PLC Control Bit 2	
Byte 0 , 7	Non fail safe	When device looses communication with PLC and bit is set then the NewCode will retain Relay 2 and 3 last state.
Byte 1 , 0	Reserved	
Byte 1 , 1	Reserved	
Byte 1 , 2	Reserved	
Byte 1 , 3	Reserved	
Byte 1 , 4	Reserved	
Byte 1 , 5	Reserved	
Byte 1 , 6	Reset Relay	Reset relay from fault.
Byte 1 , 7	Set NewCode with parameters	If bit held high for 5 seconds then relay will be parametrized with PLC settings.

The cyclic data in of the NewCode as a MA-Relay will look as follow:

Cyclic Data In (To PLC)		
Byte , Bit	**Parameter**	**Description**
Byte 0 , 0	Field Input 1	Field input 1 status
Byte 0 , 1	Field Input 2	Field input 2 status
Byte 0 , 2	Field Input 3	Field input 3 status
Byte 0 , 3	Field Input 4	Field input 4 status
Byte 0 , 4	Field Input 5	Field input 5 status
Byte 0 , 5	Field Input 6	Field input 6 status
Byte 0 , 6	Field Input 7	Field input 7 status
Byte 0 , 7	Comms Relay OK	Communication status between relay and communication module
Byte 1 , 0	Alarm Flag 0	In service
Byte 1 , 1	Alarm Flag 1	Over current, Running stall, Short circuit, Vectorial stall
Byte 1 , 2	Alarm Flag 2	Unbalance, Single phase, Low frequency, High frequency
Byte 1 , 3	Alarm Flag 3	Minimum load
Byte 1 , 4	Alarm Flag 4	Earth leakage, Earth fault, Insulation lockout
Byte 1 , 5	Alarm Flag 5	Over voltage, Under voltage, Phase rotation, Voltage symmetric
Byte 1 , 6	Alarm Flag 6	Over temperature
Byte 1 , 7	Alarm Flag 7	Frozen contact
Byte 2	I load	Current load % = I load x 4
Byte 3 , 0	Trip Flag 0	Over current, Running stall, Short circuit, Starts per hour, Vectorial stall
Byte 3 , 1	Trip Flag 1	Unbalance, Low frequency, High frequency
Byte 3 , 2	Trip Flag 2	Single phase
Byte 3 , 3	Trip Flag 3	Minimum load
Byte 3 , 4	Trip Flag 4	Earth leakage, Earth fault, Insulation lockout
Byte 3 , 5	Trip Flag 5	Under voltage, Over voltage, Phase rotation, Voltage symmetric
Byte 3 , 6	Trip Flag 6	Over temperature
Byte 3 , 7	Trip Flag 7	Frozen contact, System failure, Execution, Feedback, Unauthorized current
Byte 4	TC used	Thermal capacity used
Byte 5	RunHourHi	Running hours

Byte 6	RunHourLo	

2.8 Diagnostics For MA-Relay

Diagnostic message for MA-Relay will look as follow:

Byte	Description
0 ~ 2	Station status as per DP specifications.
3	Master profibus address.
4 ~ 5	Manufacture ID.
6	Diagnostic identification.
7	Diagnostic length.
8	Thermal capacity used.
9 ~ 10	Total running hours.
11 ~ 12	Trip fault counter.
13 ~ 14	Total number of starts.
15 ~ 16	Fault 1 (Recent) • Byte 0,0 : Over voltage. • Byte 0,1 : RTD 1. • Byte 0,2 : RTD 2. • Byte 0,3 : RTD 3. • Byte 0,4 : Frozen contact, System fault, Execution, Feedback, Unauthorized current. • Byte 1,0 : Over current, Short circuit, Starts per hour, Vectorial stall. • Byte 1,1 : Running stall. • Byte 1,2 : Unbalance, Low frequency, High frequency. • Byte 1,3 : Single phase. • Byte 1,4 : Minimum load. • Byte 1,5 : Earth leakage, Earth fault, Insulation lockout. • Byte 1,6 : Phase rotation, Voltage symmetric • Byte 1,7 : Under voltage.
17	Fault 1 date year in hexadecimal.
18	Fault 1 date month in hexadecimal.
19	Fault 1 date day in hexadecimal.
20	Fault 1 time hour in hexadecimal.
21	Fault 1 time minute in hexadecimal.
22 ~ 23	Fault 2
24	Fault 2 date year in hexadecimal.

25	Fault 2 date month in hexadecimal.
26	Fault 2 date day in hexadecimal.
27	Fault 2 time hour in hexadecimal.
28	Fault 2 time minute in hexadecimal.
29 ~ 30	Fault 3
31	Fault 3 date year in hexadecimal.
32	Fault 3 date month in hexadecimal.
33	Fault 3 date day in hexadecimal.
34	Fault 3 time hour in hexadecimal.
35	Fault 3 time minute in hexadecimal.
36 ~ 37	Fault 4
38	Fault 4 date year in hexadecimal.
39	Fault 4 date month in hexadecimal.
40	Fault 4 date day in hexadecimal.
41	Fault 4 time hour in hexadecimal.
42	Fault 4 time minute in hexadecimal.
43	Start up date year in hexadecimal.
44	Start up date month in hexadecimal.
45	Start up date day in hexadecimal.
46	Start up time hour in hexadecimal.
47	Start up time minute in hexadecimal.

3. DEFINITIONS AND TERMINOLOGY

EEPROM	Electrical Erasable Programmable Read Only Memory (non volatile)
Flash memory	Similar to EEPROM (only block write - non volatile)
GSD	Generic station description file.
In service	When the current rise above 10% of full load current it is assumed that the motor is running.
Intrinsic safe	It is a protection technique for safe operation of electronic equipment in explosive atmospheres. The concept was developed for safe operation of process control instrumentation in hazardous areas. The theory behind intrinsic safety is to ensure that the available electrical and thermal energy in the system is always low enough that ignition of the hazardous atmosphere cannot occur.
LED	Light emitting diode (It is used as visual indicators)
Motor protection relay	It is an intelligent (computerized) unit monitoring an electric motor's current and voltage supply. In case of overloading, phase lost etc. the power supply of the motor will be interrupted by the protection relay to prevent damage to the motor.
Dout	Data send from the PLC to the slave device.
Din	Data received by the PLC from a slave device.
NC-MK1-PROFI-DP1	NewCode Profibus module with DPV1 capability.
PLC	Programmable Logic Controller.

4. FUNCTIONAL DESCRIPTION

The NC-MK1-PROFI-DP1 can be broken down into the following function blocks:

- Micro-Controller
- NewCode Interface.
- Profibus Interface.
- Light Emitting Diodes (LED)

Micro-Controller – Is the core of the system. The micro-controller ensures that the operation of the NC-MK1-PROFI-DP1 gets executed. The micro-controller acts as a bridge between the NewCode and the PLC.

NewCode Interface – Is the communication bus between the NewCode and NC-MK1-PROFI-DP1. With the NewCode interface it is possible for the two micro-controllers NewCode and NC-MK1-PROFI-DP1 to exchange data.

Profibus Interface – Allows the NewCode to communicate with the PLC. With the profibus interface it is possible to update the NC-MK1-PROFI-DP1 with new values as well as the PLC.

Light Emitting Diodes – Allows the NC-MK1-PROFI-DP1 to indicate conditions to the operator.

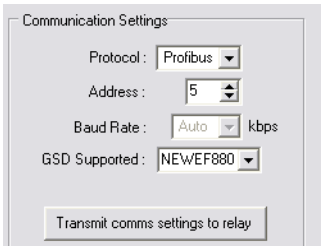
5. OPERATING INSTRUCTIONS

5.1 Getting Started

5.1.1 Setting Up The NC-MK1-PROFI-DP1

Following must be done via the NewCode front-end:

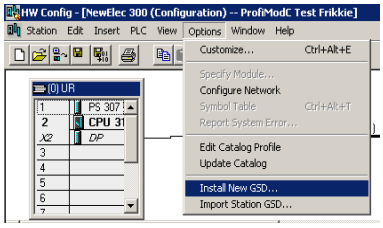
- Connect the NewCode front-end to the relay.
- Select the communication device as profibus.
- Set the address of the relay.
- Select the GSD file to be used.
- Transmit the data to the relay.

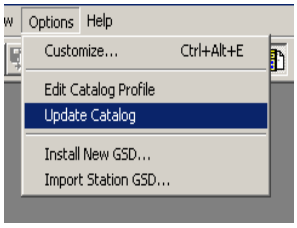


5.1.2 Installing Of NC-MK1-PROFI-DP1 GSD File STEP 7

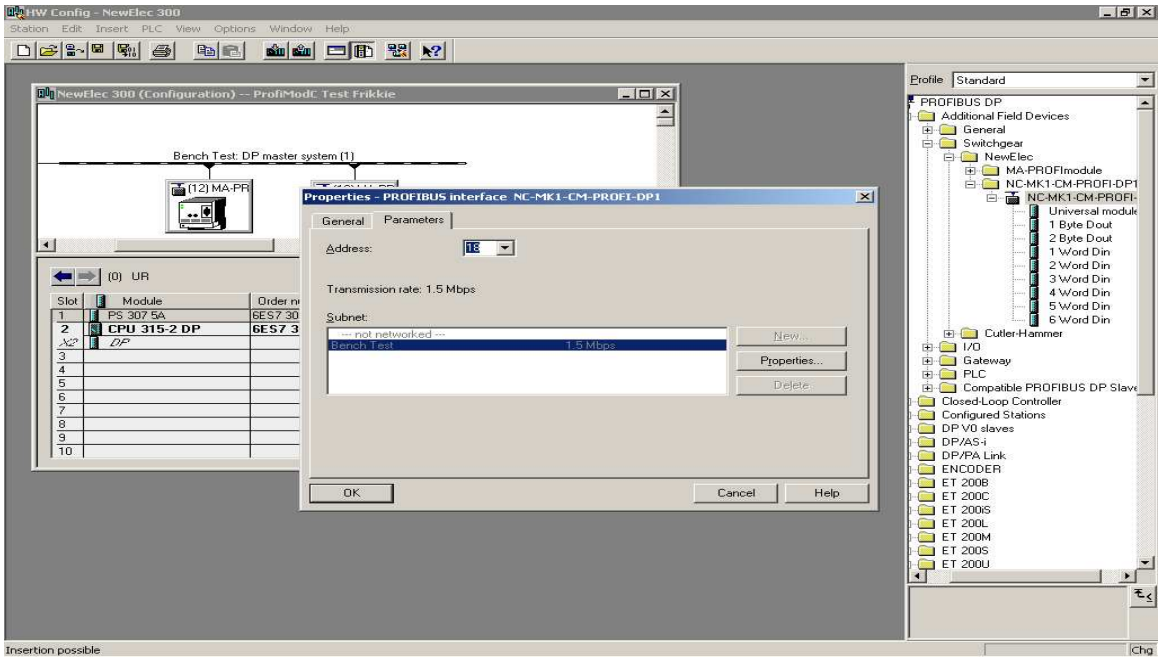
Following steps must be taken to install the GSD File into STEP7 :

- Import the CHI NEWEFF880.gsd into the STEP7 GSD directory.

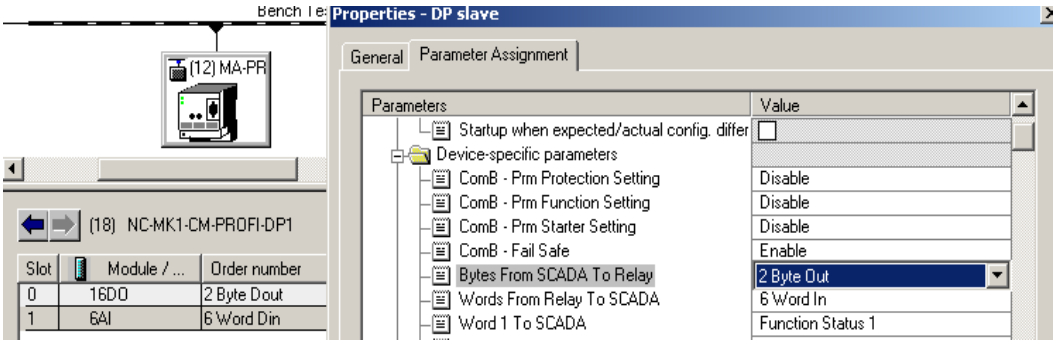




- Insert the NewCode device into the hardware configuration of the STEP7 program.
- Set the NewCode stations address in the PLC hardware configuration. The address must match the address in the NewCode.



- Set the parametrization of the NewCode.
- Make sure that the cyclic Dout and Din matches those of the NewCode



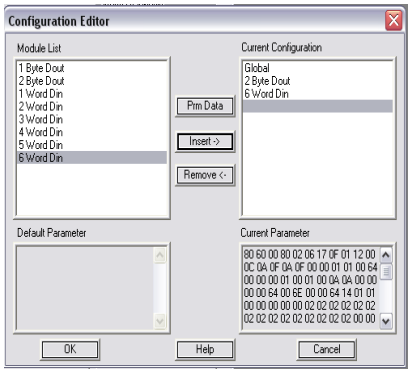
parametrization bytes.

- Cyclic In to the PLC has been default selected to the following actual variables:
- Word 1 = Function Status 1
- Word 2 = Alarm Flags A
- Word 3 = Current Level
- Word 4 = Trip Flags A
- Word 5 = TC Remaining
- Word 6 = Power Factor Level.
- Cyclic In can be altered by the user.

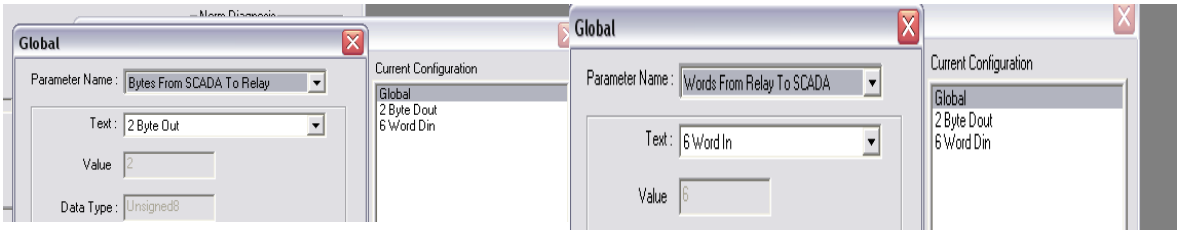
5.1.3 Installing Of NC-MK1-PROFI-DP1 GSD File ProfiSim

The following steps must be taken to load the GSD into ProfiSim:

- Open GSD file.



- Select the amount of cylic bytes out and words in.



- Make sure cyclic structure is correctly setuped in parameters.

- Set slave address and connect.

5.1.4 Setup Of Profibus DPV1 Class 1

SAP 33 can handle up 60 bytes of data at a time.

5.1.5 Setup Of Profibus DPV1 Class 2

When initializing the NC-MK1-PROFI-DP1 class 2 the following configuration must be send:

- Feature Supported : 01 Hexadecimal 00 Hexadecimal
- Profile Feature Supplied : 00 Hexadecimal 00 Hexadecimal
- Profile Ident Number : 0000 Hexadecimal

- Source API : 0
- Destination API : 0

SAP 30 to SAP 2E is the only availiable ports for the Profibus DPV1 Class 2 interface. SAP's can handle 52 bytes at a time.

5.2 Monitoring Diagnostic On Front-End

The front-end will shows the following diagnostics under the **“Statistics”** tab:

1. Profibus module present.
2. NC-MK1-PROFI-DP1 revision.
3. Parametrization status – Tells the state of the parameter telegram.
4. Configuration status – Tells the state of the configuration telegram.
5. Baud rate – Speed of the baud rate found.
6. DP State – Status of the VPC state machine.
7. VPC revision – Revision of chip placed on PCB.
8. Average cyclic message time – Time between cyclic messages.
9. Negative Error – Biggest negative time error between cyclic messages.
10. Positive Error – Biggest positive time error between cyclic messages.

6. ID NUMBER REGISTRATION FORM

PROFIBUS Nutzerorganisation e.V.
Haid-und-Neu-Str. 7
D-76131 Karlsruhe
Tel.: +49-721-96 58-590
Fax: +49-721-96 58 589
E-mail: info@profibus.com
http://www.profibus.com

Confirmation

Registration of a PROFIBUS Device

Model name :	**NC-MK1-PROFI-DP1**
Release :	**V01.00**
Manufacturer :	**NEWELEC PRETORIA (PTY) LTD**

The following details have been registered by PNO for the device mentioned above:

Device type:	☐ Master ☑ Slave
Protocol type:	☐ FMS ☑ DP ☑ DP Extensions
ID Number :	**F880 HEX**
GSD file :	**NEWEF880.GSD**

Contact person:
NEWELEC PRETORIA (PTY) LTD
Mr. Frikkie N. Marais
Development
298 Soutter Street, Pretoria West
0048 PRETORIA West
SÜDAFRIKA
Tel.: 00 27 12 32 71 729
Fax: 00 27 12 32 71 733
E-Mail: fnmarais@NEWELEC.co.ZA

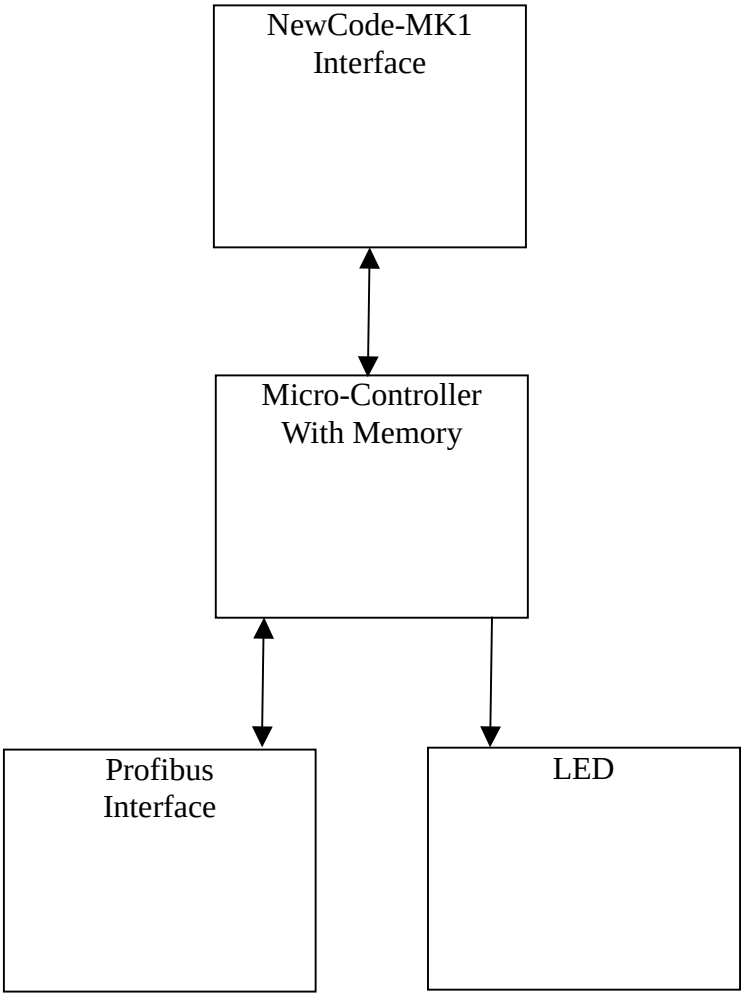
Karlsruhe, 2009-12-03
Place, Date

M. Schell
Business office of the PROFIBUS Nutzerorganisation e.V.

NEWEF880

7. DIAGRAMS

7.1 Block Diagram of NC-MK1-PROFI-DP1



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