OJ:S VÅGSYSTEM
EN DEL AV VENDIG AB

PROFIBUS DP INTERFACE FÖR OJ1436

Detta dokument gäller för OJ1436 mjukvaruversion 3.3.x

CONTENTS

1 Introduktion

1.1 Översikt

Profibus DP interface är en av de optioner som finns tillgängliga att välja i OJ1436 *smart* Belt Weigher Indicator.

Det är fabriksmonterat när man beställer detta när man gör köpet av vågen. Alternativt, kan det även köpas till i efterhand som ett separat kit, för att installeras på en befintlig vågdator.

Profibus DP interfacet ger möjligheten att ansluta OJ1436 till Profibus DP nätverk för kommunikation med en värd PLC eller datasystem.

Denna manual beskriver i detalj hur interface-kortet installeras, konfigureras och sedan kommunicerar med OJ1436.

För ytterligare information kring det allmänna handhavandet av OJ1436 *smart* Belt Weigher Indicator, vänligen läs huvudmanualen.

2 Installation

2.1 Profibus DP Interface-kort

Om Profibus-kortet har beställts som kit att eftermonteras på befintlig indikator, följ installationsanvisningarna nedan.

Notera: Tänk på att utföra detta med försiktighet vad gäller den anti-statiska aspekten.

1. Slå av spänningen.
2. Dra ur alla kontakter på baksidan av OJ1436.
3. Ersätt de gröna kontaktstyckena med de som medföljer i detta kit.
4. Skruva ur 4 x 6mm-skruvarna i den bakre panelens fyra hörn och lossa sedan den bakre panelen.
5. Notera vilka falsar som huvudkortet sitter på. Greppa en av de gröna kontakterna och dra försiktigt ut huvudkortet och dess interfacekort.

Vänligen se installationsdiagrammet när punkt 6, 7 och 8 utförs.

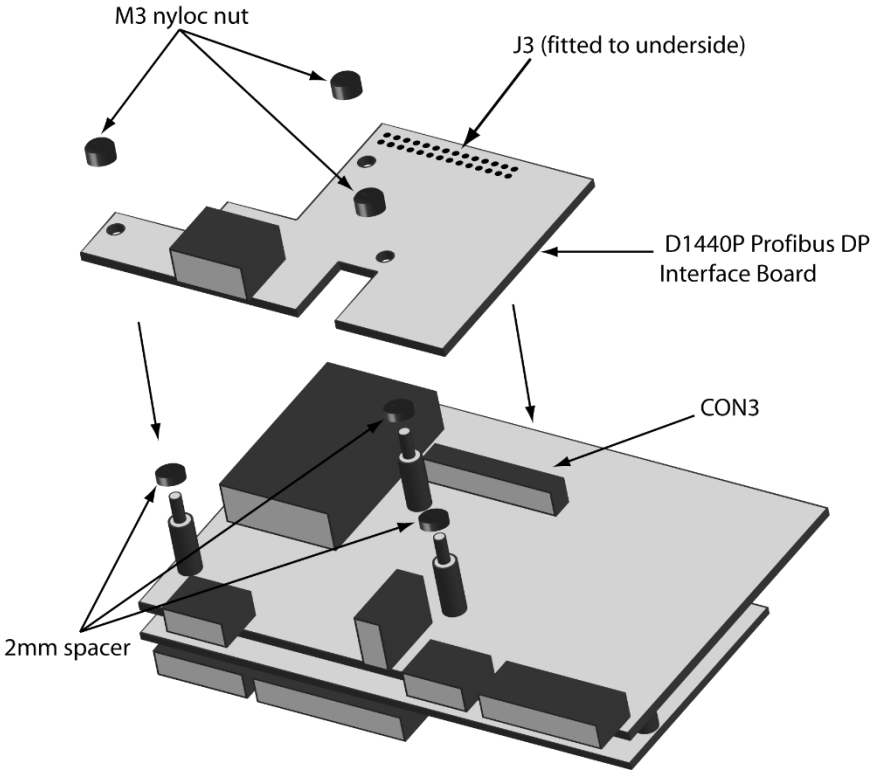
6. Montera 2mm distanserna på huvudkortet enligt bilden.
7. Anslut försiktigt D1440P Profibus DP interface boards kontakt J3 med kontakt CON3 på indikatorns huvudkort med ett mjukt tryck.
8. Använd M3 muttrarna som följer med kitet för att fästa nätverkskortet på huvudkortets distanser.
9. Skjut sedan tillbaka korten på de falsar huvudkortet drogs ut från, när kontakterna träffat varandra skjuts korten försiktigt in tills de är i botten.
10. Montera den medföljande bakpanelen och använd originalskruvarna för att skruva fast den igen.
11. Återanslut alla kontakter på baksidan.

2.1.1 Innehåll i kit

Ett kit med nätverkskort innehåller följande:

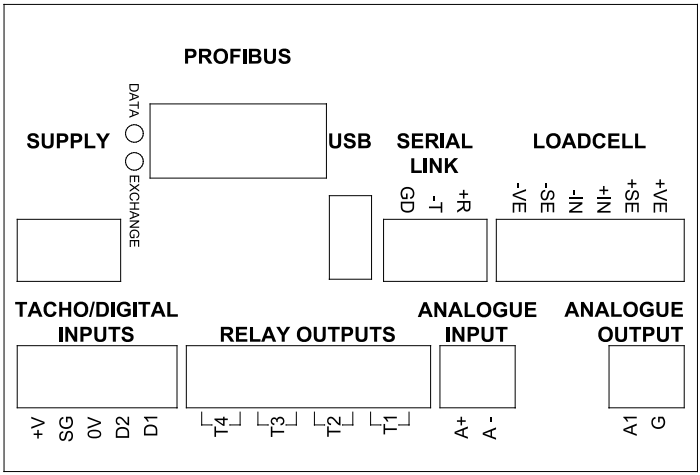
- D1440P Profibus DP interface-kort
- 3 x 2mm spacers
- 3 x M3 låsmuttrar
- Ny bakpanel
- Profibus DP Kontakt
- Kontaktstycken för Loadcell och Serial Link

2.1.2 Installationdiagram



D1440P Profibus DP Interface-kort Installation

2.2 Anslutningarnas layout



2.3 Nätverksaktivitet

Nätverkets aktivitet kan ses på baksidan av OJ1436 via två LED, enligt beskrivning nedan:

EXCHANGE Bekräftar att denna OJ1436 är redo att kommunicera i Profibus DP-network.

DATA Data överförs via mastern and denna OJ1436.

2.4 Profibus DP inkoppling

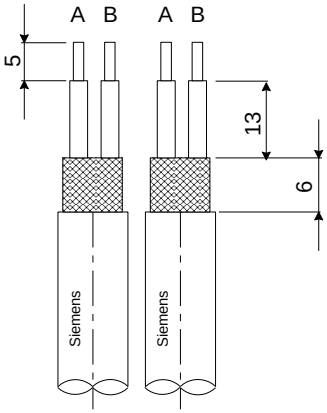
En Profibus DP Kontakt medföljer i kitet.

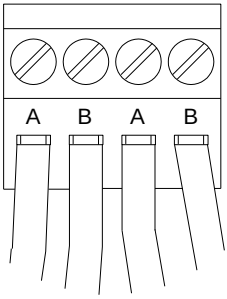
2.4.1 Kabelrekommendation

Siemens SINEC L2 Bus Cable 6XV1 830-0AH10

2.4.2 Inkoppling av kabeln

- Skala av isoleringen (se diagram nedan)
- För in de gröna och röda ledarna i skruvkontakten.
- Pressa in höljet mellan de två kabel-clipsen.
- Dra åt grön och röd ledare ordentligt i skruvkontakten.





2.4.3 Terminerande Resistor

Den första och sista noden i denna bus: Switchen på kontakten måste vara på ON (Terminerande resistor ansluten).

Alla andra noder: Switchen måste vara på OFF (Terminerande resistor bortkopplad).

3 Konfiguration

När Profibus DP interface-kortet har installerats, ska det konfigureras enligt nedan.

Åtkomst till inställningar för konfiguration:

MENY → Konfiguration → Interface → Nätverk

Parameter	Range	Factory Setting
Gränssnitt Denna parameter skall vara konfigurerad som **Profibus DP** för att det installerade kortet ska aktiveras.	None / Ethernet / EtherNet/IP / Profibus DP / DeviceNet	Ethernet
Address Denna OJ1436 adress i Profibus DP nätverket.	0 - 126	0

4 Profibus DP Kommunikation

4.1 Data Structure

The Profibus DP interface on the OJ1436 provides 40 bytes of input data to the PLC and requires 10 bytes of output data from the PLC.

All data modules are to be defined in words with consistency over the total length.

The OJ1436 is shipped with a standard GSD file.

4.1.1 Input Data to PLC from OJ1436

Total number of bytes: 40

Byte	Type	Definition
0 – 1	16-bit UINT	**Config Index** The index of the configuration parameter currently being referenced by the host. Refer to section 4.3 for details.
2 – 5	32-bit REAL	**Config Value** The value of the configuration parameter currently being referenced by Config Index. Refer to section 4.3 for details.
6 – 7	16-bit UINT	**Error Code** The current error code, this is cleared if the error is no longer present.
8 - 9	16-bit UINT	**Status** This is a bit field. Each bit represents the following functions: Bit Function 0 Belt Running 1 Dead Range 2 Tare in Progress 3 Trip 1 status (0 = off, 1 = on). 4 Trip 2 status (0 = off, 1 = on). 5 Weight Units (0 = kg, 1 = tonnes). 6 Belt Speed Units (0=m/s, 1=m/min). 7-15 Unused (always 0).

Byte	Type	Definition
10 – 13	32-bit REAL	**Flow Rate** - kg/h or t/h The current flow rate.
14 – 17	32-bit REAL	**Resettable Total** - kg or t The current resettable total.
18 – 21	32-bit REAL	**Non-Resettable Total** - kg or t The current non-resettable total.
22 - 23	16-bit UINT	**Material Number** The currently selected material number (in the range 1 – 12).
24 - 27	32-bit REAL	**Belt Load** - % The current belt load.
28 – 31	32-bit REAL	**Belt Speed** - m/s or m/min The current belt speed.
32 – 35	32-bit UINT	**Flow Time** - seconds The current flow time.
36 – 39	32-bit UINT	**Belt Running Time** - seconds The current belt running time.

4.1.2 Output Data from PLC to OJ1436

Total number of bytes: 10

Byte	Type	Definition
0 – 1	16-bit UINT	**Config Index** The index of the configuration parameter to be accessed by the host. Refer to section 4.3 for details.
2 – 5	32-bit REAL	**Config Value** The value to be written to the configuration parameter currently being referenced by Config Index. Refer to section 4.3 for details.
6 - 7	16-bit UINT	**Control Flags** This is a bit field. Each bit controls the following functions: Bit Function 0 Clear Resettable Total 1 Clear Non-resettable Total 2 Clear Flow Time 3 Clear Belt Running Time 4 Start Dynamic Tare 5 Abort Dynamic Tare 6 Write 'Config Value' to 'Config Index' while this bit is set on. 7-15 Unused.
8 - 9	16-bit UINT	**Material Number** Set the material number (in the range 1 – 12).

4.1.3 Data Types

The data types used in the above tables are:

UINT Unsigned integer
REAL Floating point

4.2 Parameterisation

4.2.1 Byte Reversal

The default byte ordering of the I/O data within the OJ1436 follows the Motorola number format (Big Endian). The individual byte ordering within each number can be reversed to accommodate masters with Intel format numbers (Little Endian). This is achieved using the second byte of the user parameterisation bytes.

Second Byte = 0	Motorola Order
Second Byte = 1	Intel Order

4.3 Calibration, Configuration & Diagnostic Data Access

It is possible to access the calibration, configuration and diagnostic data, stored within the OJ1436, via the Profibus DP interface. Each data item has an associated index value as detailed in section 4.3.3.

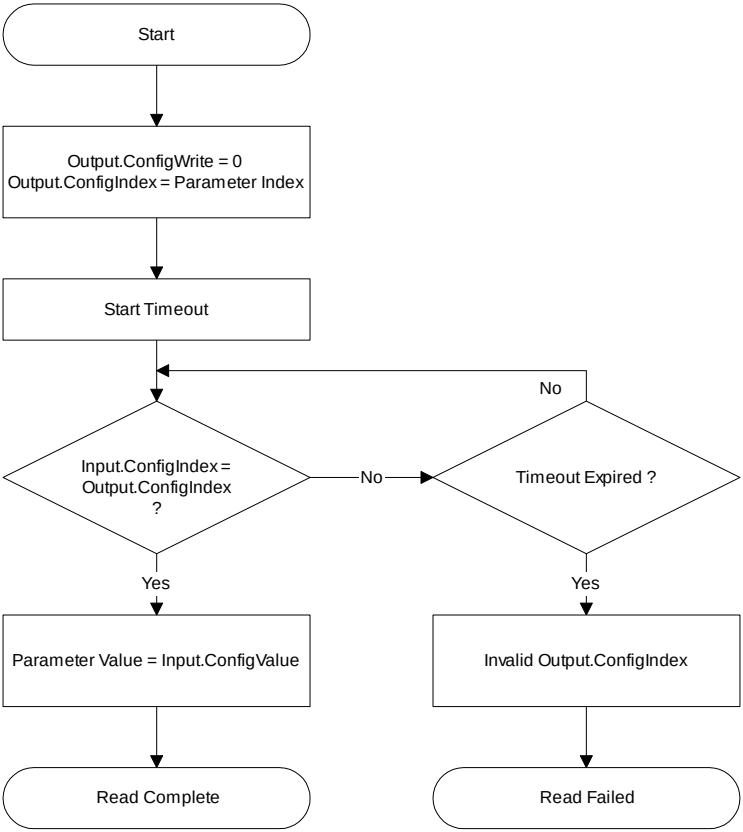
The following sections give a detailed explanation of how to implement the read and write cycles within the host system.

4.3.1 Reading

The host can read the value of any parameter by using the Config Index item within the output data module to reference the appropriate parameter.

The Config Index item within the input data module then gives verification that the parameter being referenced was found. The Config Value item within the input data module holds the current value of the referenced parameter.

The read cycle performed by the host should be implemented as represented below.



4.3.2 Writing

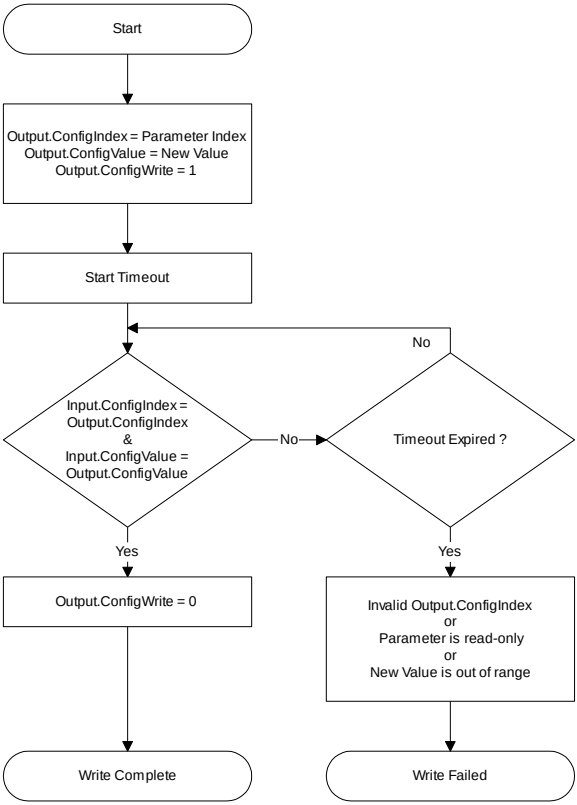
As with reading, the Config Index item within the output data module is used to reference the parameter. Additionally, the Config Value item within the output data module should be set to the value to be written and the Config Write item should then be set to 1.

The Config Index and Config Value items within the input data module then give verification that the parameter being referenced was found, is not read-only and the value written was within range.

Any out of range values written to parameters will be limited to the allowed range of the parameter.

The write cycle performed by the host should be implemented as represented below.

It is important to remove the Output.ConfigWrite flag after the write cycle, failure to do so will result in incorrect operation.


Start
Output.ConfigIndex = Parameter Index
Output.ConfigValue = New Value
Output.ConfigWrite = 1
Start Timeout
No
Input.ConfigIndex = Output.ConfigIndex & Input.ConfigValue = Output.ConfigValue
No
Timeout Expired ?
Yes
Yes
Output.ConfigWrite = 0
Invalid Output.ConfigIndex or Parameter is read-only or New Value is out of range
Write Complete
Write Failed

4.3.3 Data Item Attributes

For further information relating to the functionality of the parameters listed below refer to the OJ1436 *smart* Belt Weigher Indicator user manual.

Index	Type	Range	Item
Tare & Calibration Settings			
1	32-bit UINT	1 - 99999	**Tare Period** – tacho pulses
2	32-bit REAL	0.01-9999.99	**Calibration Period** - metres
3	32-bit UINT	1 - 999999	**Weigh Length** – mm
4	32-bit REAL	0 - 99999	**Test Weight per Weigh Length** - kg
5	32-bit UINT	1 - 999999	**Speed Sensor Diameter** – mm
6	32-bit UINT	1 - 999999	**Pulses per Sensor Revolution**
7	32-bit REAL	0.01 - 999.99	**Pulses per Metre**
8	32-bit REAL	0 - 999999	**Dead Range** kg/h or t/h
Tare & Calibration Data			
50	32-bit REAL	0 - 99999	**Tare** – kg
51	32-bit REAL	0.01-9999.99	**Calibration Factor**
52	32-bit UINT	0 - 99999	**Calibration Counter** (read only)
53	16-bit UINT	0 - 9999	**Tare Time Remaining** - seconds (read only)
Belt Weigher			
100	32-bit REAL	0 - 99999	**Load Cell Capacity** – kg
101	8-bit UINT	0 - 7	**Load Cell Input Range** 0 = 2.56V 1 = 1.28V 2 = 640mV 3 = 320mV 4 = 160mV 5 = 80mV 6 = 40mV 7 = 20mV
102	8-bit UINT	1 - 100	**Weigh Filter**
103	8-bit UINT	0 - 1	**Tacho Source** 0 = External 1 = Internal
104	16-bit UINT	1 - 500	**Internal Tacho Speed** - Hz

Index	Type	Range	Item
105	8-bit UINT	1 - 100	**Speed Filter**
106	32-bit REAL	0 - 500	**Belt Running Level** – Hz
107	8-bit UINT	0 - 1	**Weight Units** 0 = kg 1 = t
108	8-bit UINT	0 - 1	**Belt Speed Units** 0 = m/sec 1 = m/min
109	8-bit UINT	0 - 4	**Flow Rate DP**
110	8-bit UINT	0 - 4	**Resettable Total DP**
111	8-bit UINT	0 - 4	**Non-Resettable Total DP**
112	8-bit UINT	0 - 4	**Static DP**
113	32-bit REAL	0 - 99999	**Flow Rate Increments** – kg/h or t/h
Inclinometer			
200	8-bit UINT	0 - 1	**Enable Inclinometer** 0 = No 1 = Yes
201	32-bit REAL	-90 - +90	**Angle at 4mA** – degrees
202	32-bit REAL	-90 - +90	**Angle at 20mA** – degrees
General			
300	8-bit UINT	0 - 6	**Tile 1 Item** 0 = Flow Rate 1 = Resettable Total 2 = Non-Resettable Total 3 = Belt Load 4 = Belt Speed 5 = Flow Time 6 = Belt Run Time
301	8-bit UINT	0 - 6	**Tile 2 Item** (options as Tile 1 Item above).
302	8-bit UINT	0 - 6	**Tile 3 Item** (options as tile 1 item above).
303	32-bit REAL	0 - 99999	**Flow Time Level** – kg/h or t/h

Index	Type	Range	Item
Digital Inputs			
400	8-bit UINT	0 - 3	**Input D1 Function** 0 = None 1 = Print 2 = Tare 3 = Clear Total
401	8-bit UINT	0 - 3	**Input D2 Function** (options as Input D1 Function above).
Digital Outputs			
500	32-bit REAL	0 - 99999	**Output Pulse** – kg or t
501	32-bit-REAL	0.1 - 9.9	**Output Pulse Length** - seconds
502	32-bit-REAL	0 - 99999	**Trip 1 Level** – kg/h or t/h
503	8-bit UINT	0 - 1	**Output T2 Function** 0 = Healthy 1 = Trip
504	32-bit-REAL	0 - 99999	**Trip 2 Level** – kg/h or t/h
Analogue Output			
600	32-bit-REAL	0 - 99999	**Output Range** – kg/h or t/h
Serial Interface			
700	8-bit UINT	0 - 5	**Serial Mode** 0 = SABus 1 = Transmit 2 = Printed Report 3 = Modbus ASCII 4 = Modbus RTU 5 = smartTONNES
701	8-bit UINT	0 - 4	**Baud Rate** - bps 0 = 1200 1 = 2400 2 = 4800 3 = 9600 4 = 19200
702	8-bit UINT	0 - 1	**Communication Standard** 0 = RS232 1 = RS485

PROFIBUS DP INTERFACE FOR OJ1436

Index	Type	Range	Item
703	8-bit UINT	0 - 99	**Address**
704	8-bit UINT	0 - 2	**Parity** 0 = None 1 = Even 2 = Odd
705	8-bit UINT	0 - 4	**Transmit Data Item** 0 = Flow Rate 1 = Resettable Total 2 = Non-Resettable Total
706	32-bit REAL	0.1 – 99.9	**Transmit Interval** – seconds
Data Logging			
800	8-bit UINT	0 - 2	**Printed Report Log** 0 = No 1 = Internal 2 = Internal + USB
801	8-bit UINT	0 - 2	**Production Report Log** 0 = No 1 = Internal 2 = Internal + USB
802	8-bit UINT	0 - 1	**Production Log Period** 0 = Daily 1 = Clear Total
803	8-bit UINT	0 - 1	**Periodic Logging** 0 = No 1 = Yes
804	16-bit UINT	1 - 999	**Periodic Log Time**
805	8-bit UINT	0 - 1	**Periodic Log Units** 0 = Seconds 1 = Minutes
Diagnostics (Read Only)			
1000	32-bit REAL	0 - 250	**Tacho** - Hz
1001	32-bit REAL	0 - 2560	**Load Cell Signal** - millivolts

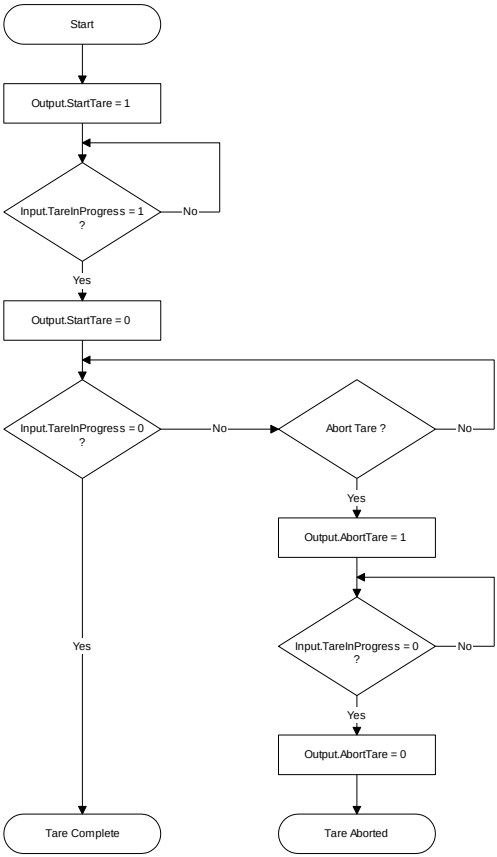
Index	Type	Range	Item
1002	32-bit REAL	0 - Load Cell Capacity	**Load Cell Weight** - kg
1003	32-bit REAL	0 - Load Cell Capacity	**Material Weight** - kg
1004	32-bit REAL	-90 - +90	**Inclinometer Angle** - degrees

4.4 Performing a Dynamic Tare

As an alternative to performing a dynamic tare at the indicator it is possible to perform a dynamic tare from the host, using the Profibus DP interface.

The Start Dynamic Tare, Abort Dynamic Tare and Tare in Progress bits within the Profibus DP data are used to control the dynamic tare process within the OJ1436. If the dynamic tare process is aborted by the host then no adjustment will be made to the tare value i.e. the existing tare will be retained.

The routine within the host should be implemented as represented below.



5 Network Diagnostic Data

The following list of network diagnostic data is accessed by operating:

MENU → Diagnostics → Communications

and then selecting the Network option

Name	Description
00: Input update	An input update has been sent to the master.
01: Output update	An output update has been received from the master.
02: SPC3 Diag	A Diagnostic packet has been sent to the Profibus master.
03: SPC3 Config	A configuration enquiry has been received from the master.
04: SPC3 Param Msg	A parameter message has been received from the master.
05: Input Length	The length of the input module.
06: Output Length	The length of the output module.
07: Param Length	The length of the last parameter packet.
08: Config Length	The length of the last configuration packet.
09: Interrupts	Count of interrupts from the SPC3.
10: Param Byte	The first byte of the parameterisation message.
11: SPC3 Reset	The number of times the SPC3 has been reconfigured.
12: Config Write	The number of configuration writes via Profibus.
13: ADC Self Cal	The number of ADC self-calibrations.
14: SPC3 Wdog Int	The Profibus watchdog has timed out.
15: SPC3 Baud Rate	A new Profibus baud rate has been found.
16: SPC3 Global Cmd	A global control command has been received.
17: SPC3 DataEx Tog.	The number of times the Data Exchange state has toggled.

Name	Description
18: SPC3 New Diag	The last diagnostic buffer used.
19: SPC3 DiagUpdate	The number of times the diagnostic data has been updated.
20: Unused	Not used.
21: SPC3 DP State	The DP state.
22: D1440 Uart Rx	Profibus interface board data receive count.
23: D1440 Uart Tx	Profibus interface board data transmit count.
24: D1440 Uart Init	Profibus interface board UART initialisation count.
25: B440 Uart Rx	Main micro board data received count.
26: B440 Uart Tx	Main micro board data transmit count.
27: B440 Uart Init	Main micro board UART initialisation count.
28: Reset Comms	The Profibus communications interface has been reset (e.g. address changed)

6 Specifikationer

Profibus Interface

Connector : 9 pin D-type
Type : Profibus DP slave
Baud Rate : upp till 12Mb
Input Size : 36 bytes
Output Size : 8 bytes

Miljö

Vid drift : -20 till +50°C, 20 till 80% RH. Icke-kondenserande.
Förvaring : -40 till + 80°C.

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