PFEIFFER VACUUM

Operating Instructions

Level Converter RS 485 / RS 232

PM 800 549 BGB/B (9903)

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1. Safety Instructions

☞ Read and follow all instructions in this manual.
☞ Regularly check that all accident prevention measures are being complied with.
☞ The ambient conditions must be taken into account when installing the level converter. The protection type is IP 20. The level converter is protected against the ingress of foreign bodies >12 mm. The unit is not water-proofed.
☞ Do not carry out any unauthorised conversions or alterations to the unit.
☞ Do not open the casing cover during operations.
☞ When returning the unit please observe the shipping instructions.

Proper Use:

– The level converter may only be used for the conversion of RS 232 and RS 485 telegrams.
– The installation instructions must be followed.
– During normal operations and in simple cases of malfunctions none of the electrical connections must carry voltages which are hazardous to touch.

Improper Use:

The following is regarded, inter alia, as improper:
– The use for purposes which are not covered above, and, in particular:
– The connection to units for which provision in their operating instructions is not made.
– The connection to units which contain touchable, voltage carrying parts.

Improper use will cause all claims for liability and guarantees to be forfeited.

2. Unit Definition

2.1. For Your Orientation

Working instruction in the text:
➡ Here you have to do something.

2.2. Product Description

The level converter is a switching unit which enables RS 232 telegrams to be converted into the RS 485 and vice versa.

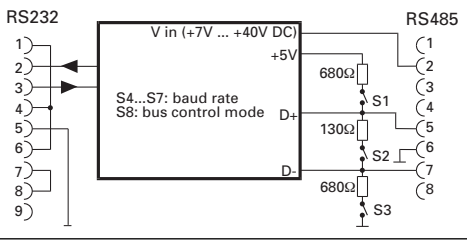
Function

Once a telegram has been transmitted from the RS 232 to the RS 485 side a telegram can be transmitted in the reverse direction at the earliest only after a waiting time interval has elapsed. The waiting time interval is dependent on the Baud rate which has been set (please see the table).

Baud Rate	Waiting Time Interval
1200 baud	9 ms
2400 baud	5 ms
4800 baud	3 ms
9600 baud	1,5 ms
19200 baud	700 µs

Function Principle

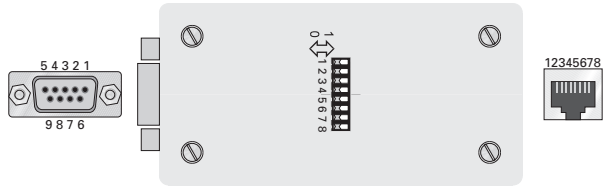
Level Converter Function Principle



3. Installation

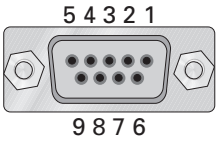
3.1. Connections And DIP Switches

Connections And DIP Switches

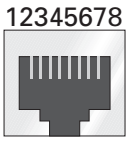


DIP-Switch	Function
1 2 3	Bus termination (none, passive or active)
4 5 6 7	Baud rate (1200, 2400, 4800, 9600 or 19200)
8	Bus control

RS 232 Connection (Sub-D Connector)



RS 485 Connection (RJ45 Connector)



RS232-Signal	Plug 25 pole[1], pin	Plug 9 pole[1], pin	RS232-Connection[2], pin
DCD	8	1	1
RxD	3	2	2
TxD	2	3	3
DTR	20	4	4
gnd	7	5	5
DSR	6	6	6
RTS	4	7	7
CTS	5	8	8
RI	22	9	9

RS485-Connection, Pin	Function
1	Not connected
2	+7V ... +40V DC 1n
3	Not connected
4	Not connected
5	D+
6	Gnd
7	D-
8	Not connected

1) For example, on the PC
2) On the level converter

3.2. Installation Instructions

Do not carry out any modifications to the level converter.

➡ Connect the RS 232 Serial Interface to the 9 pole Sub-D connector. Please use only adequate covered cable.

The above table applies where conversion to a 9 pole or 25 pole plug is involved.

➡ Connect the RS 485 Serial Interface via the RJ45 connector. Please use only the delivered or adequate covered cable.

This connector also supplies voltage to the unit. Some PFEIFFER units provide voltage on this bus so that voltage is via the connection of an 8 pole 1:1 cable.

Bus Connection

For reliable transmission an RS 485 Bus should be connected to the two remote ends. Any other units connected to this bus should not be terminated (high Ohm termination). The level converter can be operated as bus termination of any type with or without connection to the RS 232 lead. The type of bus termination on the RS 485 side can be selected with the DIP switches 1, 2 and 3 (please see the table).

DIP Switch			
1	**2**	**3**	**Bus Termination**
0	0	0	High Ohm
0	1	0	Passive, 130 Ω
1	1	1	Active, ≥ 200 mV

High Ohm Termination
The termination resistance of the RS 485 driver is high Ohm (≥ 12 kΩ). This termination is recommended where the unit is connected to a bus which has already been terminated at both ends either passively or actively.

Passive Termination
The termination resistance is 130 Ω. This setting is suitable as a termination on the end of a bus where the other end is actively terminated.

Active Termination
The differential voltage between the D+ and the D- lead is maintained at ≥ + 200 mV (logic 1) as long as no driver is active on the bus as a transmitter. This setting is only recommended where the connection of a unit is directly on the level converter or as a bus termination.

Baud Rate
The Baud rate is set via the DIP switch 4 to 7 (please see the table). Various waiting time intervals are dependent on the Baud rate (please see the table on page 6).

DIP Switch				
4	**5**	**6**	**7**	**Baud**
1	0	0	0	1200
0	1	0	0	2400
0	0	1	0	4800
1	1	1	0	9600
0	0	0	1	19200

Bus Control Mode
The level converter contains a mode which is selectable via a DIP switch 8 in which all events on the RS 485 Bus are transmitted to the RS 232 Serial Interface (please see the table). This has the result that when a telegram is transmitted from the RS 232 to the RS 485 side this telegram is reflected on the reception lead. This mode is recommended as a check that the telegram transmitted from the RS 232 side appears on the bus (this is not the case, for example, where the voltage supply fails, the level converter is defective or the bus is defective, e.g. short circuit/disconnected cable).

DIP-Switch	
8	**Bus control mode**
0	Active
1	Inactive

4. Troubleshooting

Malfunction	Possible Cause	Action
The level converter transmits “rubbish”	Incorrect Baud rate has been set.	Set the correct Baud rate. If the minimum response time has been ensured, a lower Baud rate than the rate set can be used, but on no account a higher rate.
	D+ and D- leads on the bus are interchanged.	Ensure correct bus connection.
No data is being transmitted	The voltage supply is incorrect or not connected.	Ensure the converter is supplied with appropriate voltage. Because the level converter can also be supplied via the bus, this should also be checked.
	RxD and TxD leads on the RS 232 a re interchanged.	Connect the leads correctly.
A unit (for example a PC) connected to the RS 232 side is showing a serial interface malfunction	If the bus control mode is activated it is possible that, for example, the PC program operates incorrectly where data is being transmitted and received simultaneously.	Switch off bus control mode.

5. Technical Data

Description	Value
Voltage supply:	+ 7V bis + 40V DC
Power consumption:	Dependent on the type of operations
	Approx. 500mW with high Ohm bus termination, lower voltage supply and no transmission.
	Approx. 1W with active bus, higher voltage supply and transmission in progress.

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➪ DE, AT

Herstellererklärung im Sinne folgender EU-Richtlinien:
- Maschinen 89/392/EWG
- Elektromagnetische Verträglichkeit 89/336/EWG
- Niederspannung 73/23/EWG

Hiermit erklären wir, daß das unten aufgeführte Produkt zum Einbau in eine Maschine bestimmt ist und daß deren Inbetriebnahme so lange untersagt ist, bis festgestellt wurde, daß das Endprodukt den Bestimmungen der EU-Richtlinie 89/392/EWG, Anhang II B entspricht.
Wir bestätigen Konformität mit der EU-Richtlinie über elektromagnetische Verträglichkeit 89/336/EWG und der EU-Niederspannungsrichtlinie 73/23/EWG.
Die angewandten Richtlinien, harmonisierten Normen, nationalen Normen und Spezifikationen sind unten aufgeführt.

➪ GB, IE

Manufacturer´s declaration pursuant to the following EU directives:
- Machinery Directive 89/392/EEC
- Electromagnetic Compatibility Directive 89/336/EEC
- Low Voltage Directive 73/23/EEC

We hereby certify that the product specified below is intended for installation in a machine which is forbidden to be put into operation until such time as it has been determined that the end product is in accordance with the provision of EU Directive 89/392/EEC, Annex II B.
We certify conformity with EU Electromagnetic Compatibility Directive 89/336/EEC and EU Low Voltage Directive 73/23/EEC.
The guidelines, harmonized standards, national standards and specifications which have been applied are listed below.

➪ BE, FR

Déclaration du constructeur conformément aux directives CE suivantes:
- directive machine CE 89/392/CEE
- directive CE 89/336/CEE concernant la compatibilité électromagnétique
- directive CE 73/23/CEE concernant la basse tension

Nous déclarons par la présente que le produit mentionné ci-dessous est prévu pour le montage sur une machine et que sa mise en service est interdite tant qu'il n'a pas été déterminé que le produit final répond bien aux dispositions de la directive CE 89/392/CEE, appendice II B.
Nous confirmons la conformité du produit avec la directive CE 89/336/CEE concernant la compatibilité électromagnétique et la directive CE 73/23/CEE concernant la basse tension. Les directives appliquées, normes harmonisées et les normes et spécifications nationales appliquées figurent ci-dessous.

➪ IT

Dichiarazione del costruttore ai sensi delle seguenti direttive UE:
- Macchinari 89/392/CEE
- Compatibilità elettromagnetica 89/336/CEE
- Bassa tensione 73/23/CEE

Si dichiara che il prodotto qui menzionato è destinato al montaggio in una macchina e che la sua messa in funzione è vietata sin quando non è stato accertato che il prodotto finale non rispetta le disposizioni della direttiva UE 89/392/CEE, Appendice II B.
Attestiamo la conformità con la direttiva UE sulla compatibilità elettromagnetica 89/336/CEE e la direttiva UE sulla bassa tensione 73/23/CEE.
Sono riportate in basso le direttive aplicate, le norme standardizzate nonché le norme e le specifiche nazionali utilizzatte.

➪ ES

Declaración del fabricante al tenor de las siguientes Directivas de la UE:
- Maquinarias 89/392/MCE
- Compatibilidad Electromagnética 89/336/MCE
- Baja Tensión 73/23/MCE

Por la presente declaramos que el producto mencionado más abajo está previsto para ser incorporado en una máquina y que la puesta en servicio de la misma queda prohibida en tanto que no se haya verificado que el producto final concuerda con las disposiciones resultantes de la Directiva 89/392/MCE de la UE, Apéndice II B.
De nuestra parte certificamos la conformidad con la Directiva 89/336/MCE de la UE sobre Compatibilidad Electromagnética y la Directiva 73/23/MCE de la UE sobre Baja Tensión.
Las directivas aplicadas, normas armonizadas y las normas y especificaciones nacionales aplicadas se mencionan abajo.

➪ NL

Verklaring van de fabrikant in de zin van de volgende EU-richtlijnen:
- machinerichtlijn 89/392/EEG
- richtlijn over elektromagnetische compatibiliteit 89/336/EEG
- richtlijn over laagspanning 73/23/EEG

Hiermee verklaren wij dat het hieronder genoemde produkt is bedoeld om te worden ingebouwd in een machine en dat de ingebruikneming hiervan zolang verboden is, totdat is vastgesteld dat het eindprodukt voldoet aan de bepalingen van EU-richtlijn 89/392/EEG, appendix II B.
Wij bevestigen de conformiteit met de EU-richtlijn over elektromagnetische compatibiliteit 89/336/EEG en de EEG-richtlijn over laagspanning 73/23/EEG
De toegepaste richtlijnen, geharmoniseerde normen en de toegepaste nationale normen en specificaties zijn hierna aangegeven.

➪ DK

Producenterklæring i henhold til følgende EU-direktiver:
- Maskiner 89/392/EWG
- Elektromagnetisk kompatibilitet 89/336/EWG
- Lavspænding 73/23/EWG

Hermed erklærer vi, at det nedenstående produkt er beregnet til indbygning i en maskine og at dennes idriftsættelse er forbudt, indtil det er fastslået, at slutproduktet er i overensstemmelse med EU-direktiv 89/392/EWG tillæg II B.
Vi attesterer konformitet med EU-direktiv vedrørende elektromagnetisk kompatibilitet 89/336/EWG og med EU-lavspændingsdirektiv 73/23/EWG.
De anvendte direktiver, harmoniserede standarder og de anvendte nationale standarder og specifikationer er angivet nedenfor.

➪ SE

Tillverkarens förklaring enligt följande EG-direktiv:

- Maskindirektiv 89/392/EEC

- Elektromagnetisk tolerans 89/336/EEC

- Lågspänning 73/23/EEC

Härmed förklarar vi, att den nedan nämnda produkten är avsedd för inmontering i en maskin och att denna maskin inte får tas i drift förrän det har konstaterats, att slutprodukten stämmer överens med EG's direktiv 89/392/EEC, annex II B.
Vi bekräftar konformitet med EG's-direktiv om elektromagnetisk tolerans 89/336/EEC och EG's lågspänningsdirektiv 73/23/EEC.
De riktlinjer, anpassade standarder, nationella standarder och specifikationer som har blivit accepterade, anges här nedan.

➪ FI

Valmistajan vakuutus seuraavien EU-direktiivien mukaisesti:

- konedirektiivi 89/392/ETY

- sähkömagneettinen siedettävyys 89/336/ETY

- pienjännite 73/23/ETY

Vakuutamme täten, että allamainittu tuote on tarkoitettu asennettavaksi koneeseen ja sen käyttöönotto on kielletty kunnes on todettu, että lopullinen tuote vastaa EU-direktiivin 89/392/EtY vaatimuksia.
Vahvistamme vaatimustenmukaisuuden EU-direktiivin sähkömagneettinen siedettävyys 89/336/ETY ja EU-pienjännitedirektiivin 73/23/ETY kanssa.
Soveltamamme suuntaviitat, harmonisoidut standardit, kansalliset standardit ja rakennemääräykset on luteltu alempana.

➪ PT

Declaração do fabricante, de acordo com as seguintes Directivas CE:

- Máquinas, na redacção 89/392/CEE

- Compatibilidade electromagnética, na redacção 89/336/CEE

- Baixa tensão, na redacção 73/23/CEE

Com a presente, declaramos que o produto abaixo indicado se destina à montagem numa máquina e que é proibida a colocação em serviço da mesma antes de se ter declarado, que o produto final está em conformidade com o disposto na Directiva CE, na redacção 89/392/CEE, Apêndice II B.
Certificamos haver conformidade com o disposto na Directiva CE sobre compatibilidade electromagnética, na redacção 89/336/CEE, e o disposto na Directiva CE sobre baixa tensão, na redacção 73/23/CEE.
Abaixo, dá-se indicação das directivas aplicadas, das normas harmonizadas e das normas e especificações aplicades no respectivo país.

➪ GR

Δήλωση κατασκευαστή κατά το νόημα των εξής οδηγιών της Ε.Ε:

- περί μηχανών 89/392/Ε.Ο.Κ.

- περί ηλεκτρομαγνητικής συμβατότητας 89/336/Ε.Ο.Κ.

- περί χαμηλής τάσης 73/23/Ε.Ο.Κ.

Με την παρούσα δήλωση βεβαιώνουμε ότι το κατωτέρω αναφερόμενο προϊόν προορίζεται για την προσαρμογή σε μία άλλη μηχανή, και ότι η έναρξη λειτουργίας της απαγορεύεται μέχρις ότου διαπιστωθεί, ότι το συνολικό συγκρότημα ανταποκρίνεται στους ισχύοντες κανονισμούς της οδηγίας της Ε.Ε. 89/392/Ε.Ο.Κ., παράρτημα ΙΙ Β.
Οι εφαρμοσθέντες κανονισμοί, οι εναρμονισμένες προδιαγραφές και οι εφαρμοσθείσες εθνικές προδιαγραφές και τεχνικές προδιαγραφές αναφέρονται κατωτέρω

Produkt/Product/Produit/Prodotto/Producto/Produkt/Produkt/Produto/ Προϊον:

Level Converter

Angewendete Richtlinien, harmonisierte Normen und angewendete, nationale Normen in Sprachen und Spezifikationen:
Guidelines, harmonised standards, national standards in languages and specifications which have been applied:
Les directives appliquées, normes harmonisées et les normes nationales appliquées en langues et spécifications:
Direttive aplicate, norme standardizzate e norme nazionali utilizzate in lingue e specifiche:
Directivas aplicadas, normas armonizadas y normas nacionales aplicadas en idiomas y especificaciones:
Toegepaste richtlijnen, geharmoniseerde normen en toegepaste nationale normen met betrekking tot talen en specificaties:
Anvendte direktiver, harmoniserede standarder og de anvendte nationale standarder med sprog og specifikationer:
Directivas aplicadas, normas harmonizadas e normas aplicadas na linguagem e nas especificações do respectivo país:
Εφαρμοσθέντες κανονισμοί, εναρμονισμένες προδιαγραφές και εφαρμοσθείσες εθνικές προδιαγραφές σε γλώσσες και τεχνικές προδιαγραφές:

EN 61010, EN 55011, EN 50081-1, EN 50082-2, IEC 801 1-4, VDE 0843-6

Unterschriften/Signatures/Signature/Firme/Firmas/Handtekeningen/Underskrifter/Underskrift/ Allekirjoitukset/Assinaturas/ Υπογραφές:

Geschäftsführer (W. Dondorf)
Managing Director
Gérant d'affairs
Gerente
Διευθύνων Σύμβουλος

Administrerende Direktør
Verkställande Direktör
Directeur