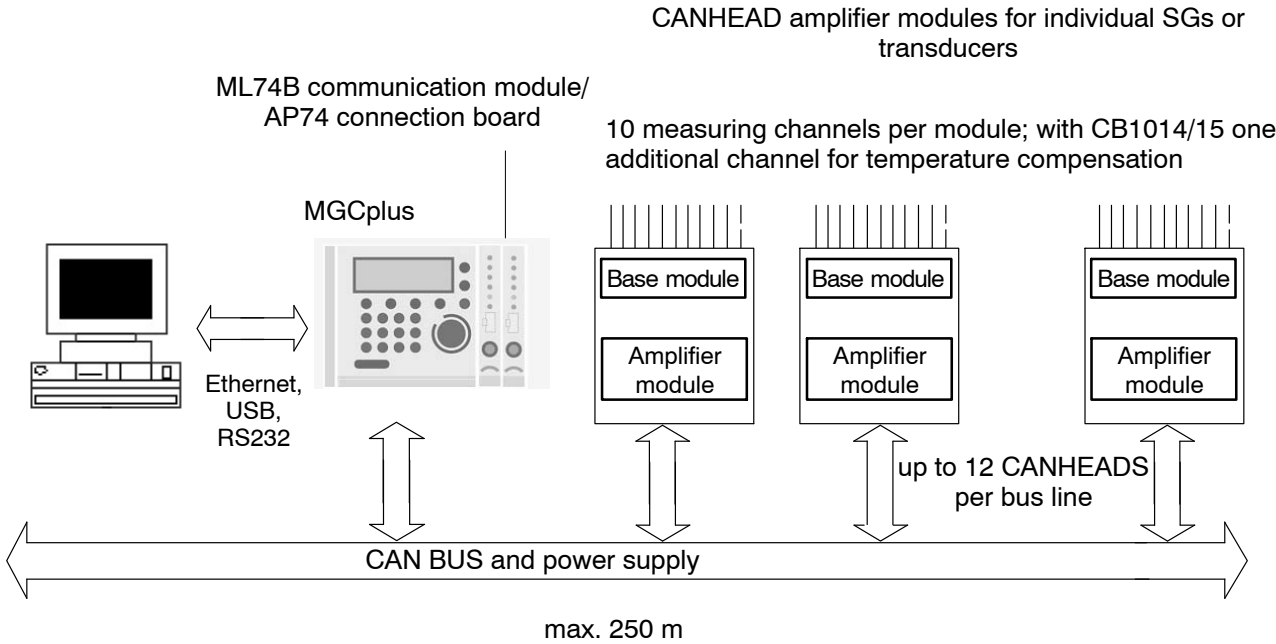




Special features

- 10-channel amplifier modules for installation close to measuring points
- Measured data transmission to communication master via field bus
- Base modules for individual SGs, SG full and half bridges, DC voltage sources
- Suitable for unlimited cascading
- Uniform amplifier module for all base module types
- Connection of amplifier module/base module by simply plugging in

Distributed measurement acquisition



Specifications

| Amplifier module | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------|------------|-----------------|-------------------------------------------|------|------|
| Type | CA1030 | | | | | | | |
| Accuracy class | 0.1 | | | | | | | |
| Carrier frequency | 600 | | | | | | | |
| Number of measurement channels | 10 (plus 1 compensation channel) | | | | | | | |
| Bridge excitation voltage ¹⁾ | 0.5; 1.0; 2.5 (global changeover for all channels) | | | | | | | |
| Measuring ranges | mV/V | 20; 10; 4 (acc. to bridge excitation voltage) | | | | | | |
| Measurement resolution | bits | up to 23 | | | | | | |
| Sampling rates ²⁾ | 1/s | 1; 2; 5; 10; 20; 25; 30; 50; 60; 100; 150; 300 | | | | | | |
| Filter type: Bessel | | Nom. value (Hz) | -3 dB (Hz) | -1 dB (Hz) | Delay-time (ms) | Internal Sampling rate ⁴⁾ (Hz) | | |
| | | 25 | 23.2 | 13.1 | 13.3 | 300 | | |
| | | 10 | 10.43 | 5.94 | 33.3 | 300 | | |
| | | 5 | 5.08 | 2.90 | 76.7 | 150 | | |
| | | 2.5 | 2.523 | 1.439 | 163.3 | 75 | | |
| | | 1.25 | 1.259 | 0.718 | 336.6 | 37.5 | | |
| | | 0.6 | 0.6297 | 0.359 | 683.3 | 18.75 | | |
| | | 0.15 | 0.1623 | 0.0910 | 1712 | 300 | | |
| | | 0.08 | 0.0811 | 0.0455 | 3411 | 300 | | |
| | | 0.04 | 0.0406 | 0.0227 | 6814 | 150 | | |
| Additional phase delay resulting from CANbus data transmission, depending on the number of CANHEADs assigned on the ML74B. | Number | 1 | 2 | 3 | 4 | 5 | 6 | 7-12 |
| | ms | 6.67 | 13.33 | 20.0 | 26.7 | 33.3 | 40.0 | 80.0 |
| Noise Filter ³⁾ Noise, typ. (peak-peak) of the measuring range | Hz % | 25 0.015 | 10 0.009 | 5 0.006 | 2.5 0.004 | 1.25 0.003 | | |
| Power supply (electrically isolated in the amplifier) | V | 10...36 | | | | | | |
| Insulation resistance (supply to SG connection, CAN bus or housing) | V | 50 | | | | | | |
| Power consumption Module (without SGs) Module with max. SG count | W W | typ. 1 typ. 1.8 | | | | | | |
| CAN bus interface | | | | | | | | |
| Baud rate | kBaud | 250 | | | | | | |
| Bus length, max. (see table on next page, top) | m | 250 | | | | | | |
| Number of base modules on the bus, max. | | 12 (=120 channels) | | | | | | |
| Synchronization | | all the bus nodes are synchronized phase-locked with defined CAN messages | | | | | | |
| Insulation resistance | | 50 | | | | | | |
| Mechanical system and environment | | | | | | | | |
| Connection to base module | | all connections via a 64-pin VG strip (DIN 61412) | | | | | | |
| Dimensions (w x l x h), approx. | mm | 118 x 71 x 23 | | | | | | |
| Weight, approx. | g | 120 | | | | | | |
| Temperature range Operation Storage | °C °C | -30 ... + 70 -30 ... + 70 | | | | | | |
| Perm. rel. humidity, non-condensing | % | 10 ... 90 | | | | | | |
| Degree of protection | | not relevant, as plug-in module | | | | | | |
| Maximum configuration per ML74B per MGC system (max. two ML74B) | | max. 12 CANHEADs (120 SG measuring points) max. 24 CANHEADs (240 measuring points), any desired number of cascadeable MGCplus | | | | | | |

¹⁾ When using half bridge (full bridge) with CB1010 and an excitation voltage of 2.5 V, the transducer impedance must be 120 ohms (230 ohms) at least.

²⁾ The data transmission rate of the CANbus is limited to a total of 3,000 values/s. Therefore, if several CANHEADs are connected to the same bus line, the sampling rate of each individual module may be additionally limited (e.g. 5 CANHEADs correspond to 50 channels on one bus line; max. sampling rate: 60 Hz).

³⁾ When used with CB1010 in a half-bridge configuration, the noise is independent of the current filter setting; the filter frequency specification 25 Hz applies.

⁴⁾ In the CA1030, the sampling rate on the input side is 1200 Hz. Implementation of digital filters requires a reduction of the sampling rate (through repeated averaging and subsampling). This reduced sampling rate is called "internal sampling rate".

Specifications

| Maximum bus length in m (without drop lines, Thin Media Cable, 0.38 mm ² , ambient temperature < 45°C) | | | | |
|-------------------------------------------------------------------------------------------------------------------|--------|--------|--------|----------|
| for quarter bridges with... | 120 Ω | – | 350 Ω | ≥ 700 Ω |
| for half bridges with... | 120 Ω | – | 350 Ω | ≥ 700 Ω |
| for full bridges with... | 240 Ω | 350 Ω | 700 Ω | ≥ 1400 Ω |
| for DC voltage measurement | – | – | – | – |
| Power consumption per CANHEAD ¹⁾ about | 1.70 W | 1.35 W | 1.15 W | 1.00 W |
| No. of CANHEADs ²⁾ | | | | |
| 12 | 90 m | 125 m | 140 m | 165 m |
| 11 | 100 m | 140 m | 155 m | 180 m |
| 10 | 110 m | 155 m | 170 m | 200 m |
| 9 | 120 m | 170 m | 190 m | 220 m |
| 8 | 135 m | 190 m | 215 m | 250 m |
| 7 | 155 m | 220 m | 250 m | 250 m |
| 6 | 180 m | 250 m | 250 m | 250 m |
| 5 | 220 m | 250 m | 250 m | 250 m |
| ≤ 4 | 250 m | 250 m | 250 m | 250 m |

¹⁾ 2.5 V bridge excitation voltage (most unfavorable case)

²⁾ Bus length computed for the case of all CANHEAD modules concentrated near the end of the bus line (most unfavorable case)

| Base modules for individual SGs in quarter-bridge connection | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------|
| Type | | CB1014 | CB1015 | CB1016 |
| | | 3-wire circuitry | 4-wire circuitry | |
| Transducer | | Single SG | | |
| Available versions Each base module is provided with an internal completion resistor. Its resistance value depends on the respective version. | | 120 Ω 350 Ω 700 Ω 1000 Ω | 120 Ω 350 Ω – – | |
| Max. connection lengths for 3-wire and 4-wire circuitry as per EN IEC 61000-4-5 | m | 30 | | |
| Related amplifier module | | CA1030 | | |
| Number of measurement channels | | 10 (plus 1 compensation channel) | | 10 |
| Selectable compensation methods for all channels simultaneously, individually disconnectable or connectable | | – no compensation – with compensation – with PT100 and polynomial correction | | – |
| Temperature range for PT100 compens. | °C | –100 ... +200 | | –100 ... +200 |
| Shunt resistor external internal | | A shunt resistor with certification that can be plugged into a plinth can be cut in to all the measuring points one after the other. Standard misalignment 1 mV/V | | |
| Miscellaneous | | All the relevant channel and measuring point information is saved in non-volatile memory. | | |
| Mechanical system and environment | | | | |
| CAN BUS connection (male and female connectors) | | 5-pin M12 fixed connector for CAN bus and excitation (as per the DEVICENET specification) | | |
| Amplifier installation | | 64-pin VG socket connector strip | | |
| Measuring point connection | | CAGE CLAMP spring-loaded terminals for line cross-sections 0.08 ... 0.5 mm ² (AWG 28...20). Plus solder pads for soldering | RJ45 shielded sockets *) | |
| Displays | | 2 status LEDs | | |
| Enclosures | | Aluminum | | |
| Dimensions (w x l x h), approx. | mm | 182 x 131 x 40 | | |
| Weight, approx. | g | 540 (without CA1030) | | |
| Protection system | | IP30 | | |
| Temperature range Operation Storage | °C °C | –30 ... +70 –30 ... +70 | | |
| Perm. rel. humidity, non-condensing | % | 10 ... 90 | | |
| EMC compliance applies with CA1030 amplifier module plugged in | | per EN 61326 (if shielded cables and, if required, shielded plugs are used) | | |

*) For EMC reasons, we advise against using RJ11 plugs, that are electromechanically compatible, instead of shielded RJ45 plugs.

Specifications

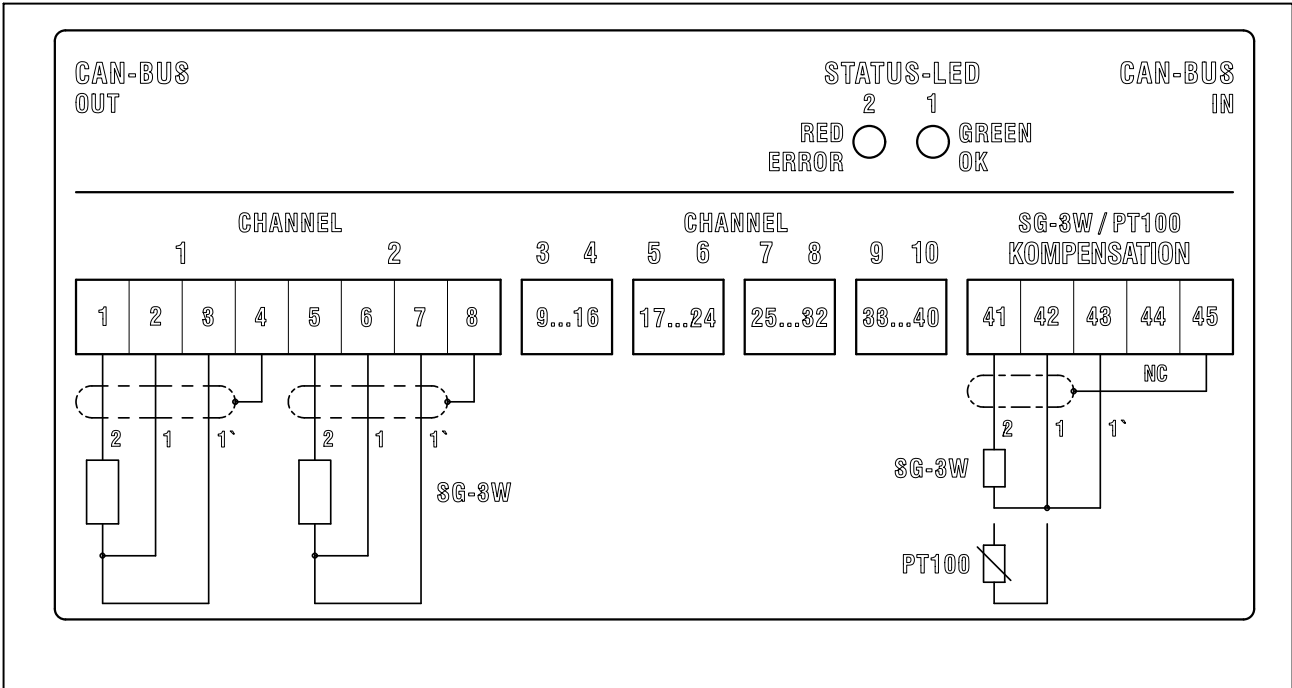
| Base module for SG half and full bridges, measurement of DC sources | | |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type | | CB1010 |
| Accuracy class | % | With strain-gage half and full bridges: 0.1 With measurement of DC voltage sources: 0.2 |
| Transducer Types Excitation | | Full and half bridges in regulated 6-wire circuitry, DC sources Setting of excitation voltage for full and half bridges via the measuring amplifier |
| Voltage input Measuring range Perm. common-mode voltage (channel-channel; channel housing) Input resistance, symmetrical | V_{DC} V M Ω | ± 10 ± 45 2 |
| Connection lengths, max. ¹⁾ | m | 30 |
| Mixed operation | | All channels individually configurable for full bridge, half bridge or 10 VDC |
| T-ID/TEDS | | For full and half bridge in zero wire technology With voltage signals, connection to separate cable cores is required |
| Related amplifier module | | CA1030 ²⁾ |
| Number of measurement channels | | 10 |
| Power consumption | W | < 0.1 (without transducer and without measuring amplifier) |
| Miscellaneous | | All the relevant channel and measuring point information is saved in a non-volatile memory |
| Mechanical properties and environment | | |
| CAN BUS connection (male and female connectors) | | 5-pin M12 fixed connector for CANBUS and supply (as per the DEVICENET specifications) Electrical isolation between CANBUS and supply |
| Amplifier installation | | 64-pin VG socket connector strip |
| Measuring point connection | | RJ45 shielded sockets |
| Displays | | 2 status LEDs |
| Enclosures | | Aluminum |
| Dimensions (w x l x h), approx. | mm | 182 x 131 x 40 |
| Weight, approx. | g | 540 (without CA1030) |
| Protection system | | IP 20 |
| Temperature range Operation Storage | $^{\circ}\text{C}$ $^{\circ}\text{C}$ | -30 ... + 70 -30 ... + 70 |
| Perm. rel. humidity, non-condensing | % | 10 ... 90 |
| EMC compliance , applies for all base modules with plugged in CA1030 amplifier module | | per EN 61326 (if shielded cables and shielded plugs are used) |

¹⁾ as per EN IEC 61000-4-5

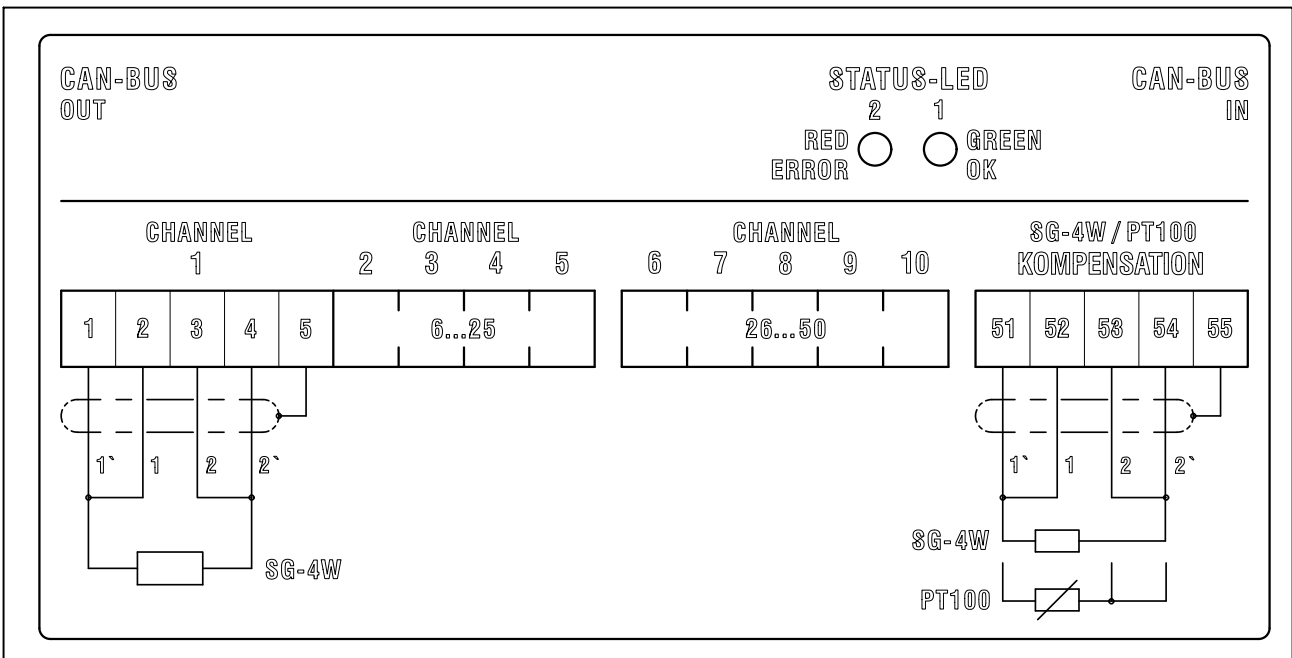
²⁾ required hardware revision: 1.20 or higher

Documentation for the CANHEAD system with ML74B and AP74 is included on the MGC system CD.

Pin assignment CB1014/1015

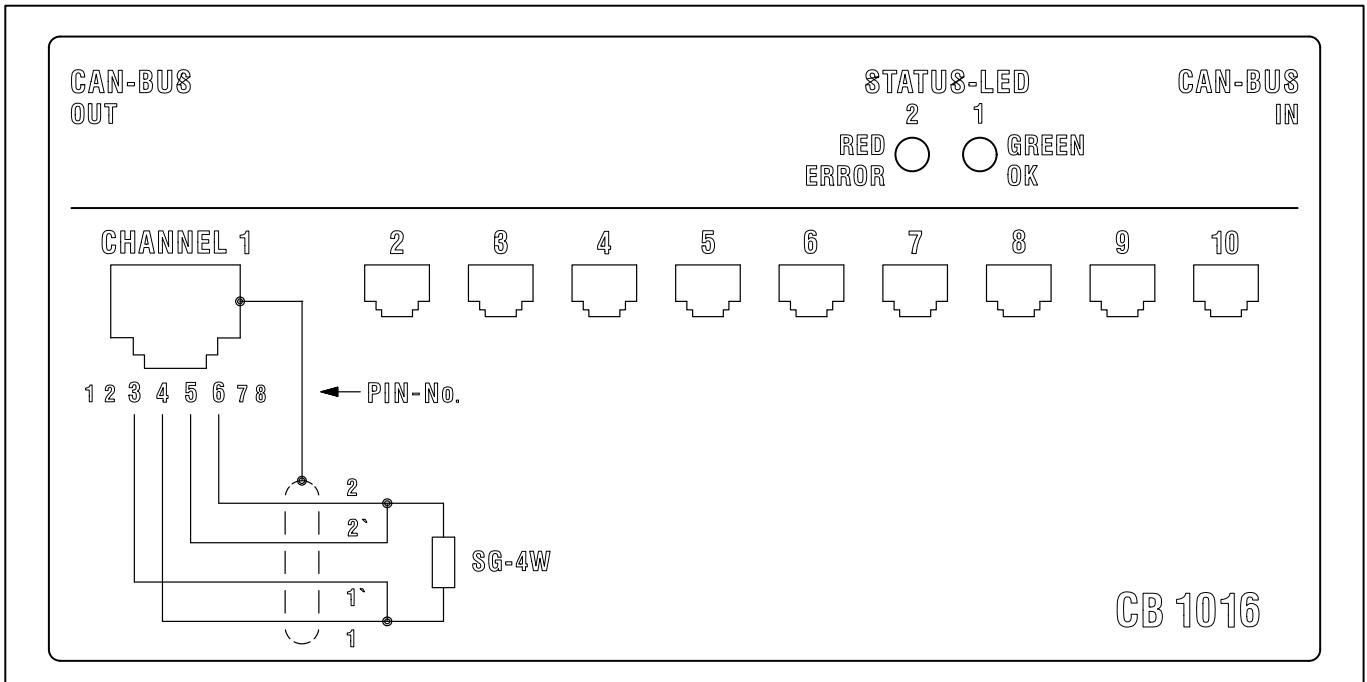


CB1014 assignment (three-wire circuit)



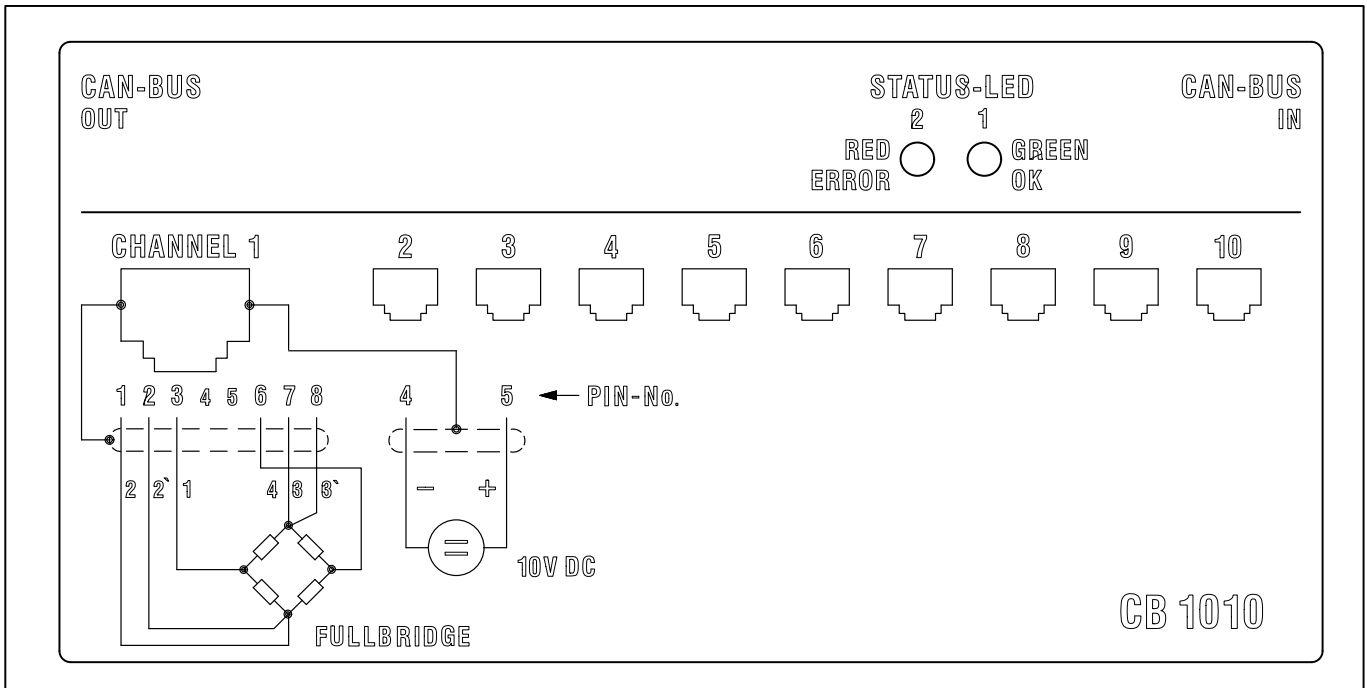
CB1015 assignment (four-wire circuit)

Pin assignment CB1016



CB1016 assignment (four-wire circuit)

Pin assignment CB1010



Full bridge and DC connector assignment¹⁾

¹⁾ In a half-bridge configuration the same assignment applies as in a full-bridge configuration, though wire 4 is omitted, meaning pin 6 is disabled.

Table of types and scope of supply

Amplifier module: CA1030

Base module

| Completion resistor (Ω) | Quarter bridge / 3-wire | Quarter bridge 4-wire | Quarter bridge 4-wire | Half and full bridges, DC voltage sources |
|-------------------------|-------------------------|-----------------------|-----------------------|-------------------------------------------|
| | Terminal connector | | RJ45 connector | |
| – | – | – | – | CB1010 |
| 120 | CB1014–120 | CB1015–120 | CB1016–120 | – |
| 350 | CB1014–350 | CB1015–350 | CB1016–350 | – |
| 700 | CB1014–700 | CB1015–700 | – | – |
| 1000 | CB1014–1000 | CB1015–1000 | – | – |

Scope of supply

Base or amplifier module

Mounting instructions

With CB1014 and CB1015: 11 cable bushings each Ø5.2 mm and 7.5 mm

Accessories, to be ordered separately:

Order number:

CANBUS:

T-piece

1–Canhead–M12–T

M12 male and female connector

1–Canhead–M12

M12 CAN termination resistor

1–Canhead–TERM

2 m connection cable

1–Kab267–2 (Devicenet cable, with integral connectors for setting up a CAN line)

Cable by the meter

4–3301.0180

ML74B

1– ML74B (see documentation for MGCplus)

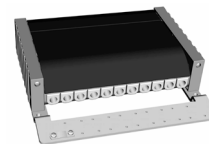
AP74

1– AP74 (see documentation for MGCplus)

Mounting set

1–Canhead–MOUNT

consisting of 1 pc. adapter frame with strain relief for the measurement cable



and 2 pc. adapter lugs to be mounted on side



Measuring point connection for CB1010:

Connection cable with loose ends and 8–pin RJ45 connector, 3 m long

1–KAB156–3

Adapter cable (RJ45/DSUB 15–pin)

1–KAB417

IP65 housing

on request

Modifications reserved.

All product descriptions are for general information only. They do not represent any form of guarantee under the law and constitute no form of liability.

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