# 8EAC0152.001-1

## 1 General information

Analog multi-encoder plug-in module 8EAC0152.001-1 can be used in the slot on an ACOPOS P3 8EI servo drive. The module contains an analog multi-encoder interface for evaluating analog encoders.

The plug-in module evaluates encoders that are built into B&R servo motors or used to evaluate external axes.

The encoder input signals are monitored. This makes it possible to detect open circuits, short circuits and failures of the encoder power supply (reference signal).

When switched on, the plug-in module is automatically identified by the operating system on the ACOPOS P3 8EI servo drive.

### Information:

**The encoder interfaces of 8EAC plug-in modules are each permanently assigned to an axis (motor connection X5xx) of the 8EI servo amplifier in which the respective 8EAC plug-in module is being operated.**

| 8EAC encoder interface plug-in module | Assignment | | |
|---|---|---|---|
| | 8EIxxxxxS... 1-axis modules | 8EIxxxxxD... 2-axis modules | 8EIxxxxxT... 3-axis modules |
| X41x | X51 / X51A | X51 / X51A | X51 / X51A |
| X42x | --- | X52 | X52 |
| X43x | --- | --- | X53 |

**Supported encoder types**

- SinCos
- EnDat 2.1, serial with evaluation of sinusoidal output signals
- HIPERFACE
- SSI SinCos, serial with evaluation of sinusoidal output signals

### Information:

**The encoder type for the multi-encoder interface is not predefined from the factory.**
**Before commissioning, configure the encoder type for each multi-encoder interface and – depending on the encoder type – the encoder supply voltage in Automation Studio!**

### Caution!

**An incorrect configuration can result in irreparable damage to the connected encoder!**

The following encoder types are supported:

| | SinCos | EnDat 2.1 | SSI SinCos | HIPERFACE |
|---|---|---|---|---|
| Encoder power supply | 5.2 V ±0.1 V<br>11.45 V ±0.1 V 3) | 5.2 V ±0.1 V | 5.2 V ±0.1 V<br>11.45 V ±0.1 V 3) | 11.45 V ±0.1 V |
| Compensation 1) | Max. 2x 0.7 V | | | --- |
| Terminating resistors | 120 Ω | | | |
| Signal frequency | DC up to 400 kHz | | | DC up to 200 kHz |
| Transfer rate | --- | 781.25 kbit/s | 100 to 400 kbit/s | 9600 bit/s |
| Support 2) | ACOPOS operating system 5.00.0 and higher | | | ACOPOS operating system 5.05.0 and higher |

Table 1: Encoder types - Overview

1) Compensation takes place by configuring the cable resistance in Automation Studio.
2) Operating system version from which a certain encoder type is supported.
3) 11.45 V encoder power supply is supported by ACOPOS operating system 5.10.0 and later.

# 2 Order data

| Order number | Short description | Figure |
|---|---|---|
| | **Plug-in modules** |   |
| 8EAC0152.001-1 | ACOPOS P3 plug-in module, analog multi-encoder interface | |
| | **Optional accessories** | |
| | **Adapter cables** | |
| 8ECG00X4.3151D-0 | ACOPOS P3 adapter cable, length 0.4 m, for analog multi-encoder interfaces and incremental encoder interfaces, 5x 2x 0.14 mm², 10-pin male IX connector to 15-pin female DSUB | |

Table 2: 8EAC0152.001-1 - Order data

# 3 Technical data

| Order number | 8EAC0152.001-1 |
|---|---|
| **General information** | |
| Module type | ACOPOS P3 plug-in module |
| B&R ID code | 0xEFDF |
| Slot | Slot 1 |
| Max. power consumption | 12 W |
| Certifications | |
| CE | Yes |
| UKCA | Yes |
| UL | cULus E225616<br>Power conversion equipment |
| KC | Yes |
| **Encoder connection** | |
| Module-side connection | 10-pin male connector |
| Status indicators | None |
| Max. encoder cable length | 75 m |
| **Encoder inputs** | |
| Sine/Cosine inputs | |
| Signal transmission | Differential signals, symmetrical [1)] |
| Signal frequency | Depends on the configured encoder type |
| Terminating resistor | 120 Ω |
| Resolution | 12-bit |
| **Encoder power supply** | |
| Output voltage | Configurable<br>Typ. 11.45 V ±0.1 V / 5.2 V ±0.1 V |
| Load capacity | Max. 300 mA for 5.2 V<br>Max. 200 mA for 11.45 V [2)] |
| Protective measures | |
| Overload-proof | Yes |
| Short-circuit proof | Yes |
| Sense lines | None [3)] |
| **Reference input** | |
| Signal transmission | Differential signal, symmetrical |
| Differential voltage for low | ≤-0.2 V |
| Differential voltage for high | ≥+0.2 V |
| Terminating resistor | 120 Ω |
| **Position** | |
| Resolution @ 1 $V_{SS}$ | $2^{14}$ increments * number of encoder lines |
| **Synchronous serial interface** | |
| Signal transmission | RS485 |
| Data transfer rate | Depends on the configured encoder type |
| **Support** | |
| Motion system | |
| mapp Motion | 5.1.0 and higher |
| ACP10/ARNC0 | 5.00.0 and higher |

Table 3: 8EAC0152.001-1 - Technical data

| Order number | 8EAC0152.001-1 |
|---|---|
| **Ambient conditions** | |
| Temperature | |
| Operation | |
| Nominal | 5 to 40°C |
| Maximum | 55°C |
| Storage | -25 to 55°C |
| Transport | -25 to 70°C |
| Relative humidity | |
| Operation | 5 to 85% |
| Storage | 5 to 95% |
| Transport | Max. 95% at 40°C |
| **Mechanical properties** | |
| Dimensions | |
| Width | 82 mm |
| Length | 24 mm |
| Depth | 103 mm |
| Weight | 64 g |

Table 3: 8EAC0152.001-1 - Technical data

1) HIPERFACE encoder type: Asymmetrical
2) Up to revision C0, the load capacity is reduced from 200 mA to 100 mA at an output voltage of 11.45 V and ambient temperatures starting at 40°C.
3) Possible to compensate for encoder voltage drop by configuring cable resistance (max. 2x 0.7 V at 5 V output voltage)

# 4 Wiring

## 4.1 Pinout

## Information:

**Plug-in module 8EAC is not capable of hot plugging. An 8EAC plug-in module is only permitted to be connected to or disconnected from an ACOPOS P3 8EI servo drive when power to the servo drive is switched off.**

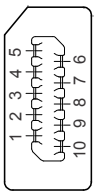
| Figure | X41M | Pin | Name | Function depending on configured encoder type | | | |
|---|---|---|---|---|---|---|---|
| | | | | SinCos | EnDat 2.1 | SSI SinCos | HIPERFACE |
|   |   | 1 | B\ | Channel B inverted | | | REF cosine |
| | | 2 | B | Channel B | | | Cosine |
| | | 3 | GND | Encoder power supply 0 V | | | |
| | | 4 | A\ | Channel A inverted | | | REF sine |
| | | 5 | A | Channel A | | | Sine |
| | | 6 | R | Reference pulse | Data + | | |
| | | 7 | R\ | Reference pulse inverted | Data - | | |
| | | 8 | U+ | Encoder power supply 5 V | | | Encoder power supply 12 V |
| | | 9 | T- | Temperature sensor - | Clock - | | Temperature sensor - |
| | | 10 | T+ | Temperature sensor + | Clock + | | Temperature sensor + |

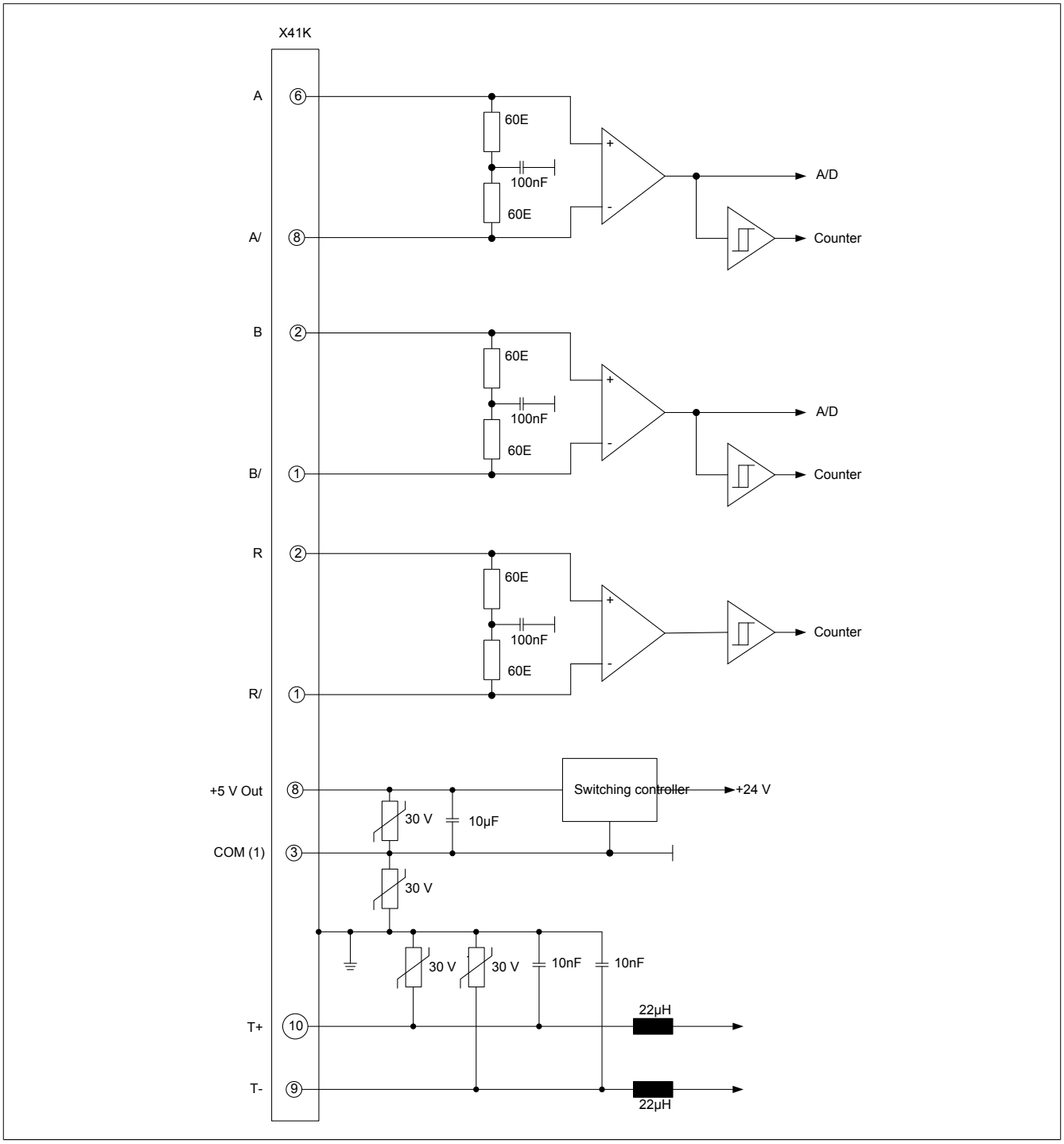
Table 4: Analog multi-encoder interface 8EAC0152.001-1 - Pinout

## Danger!

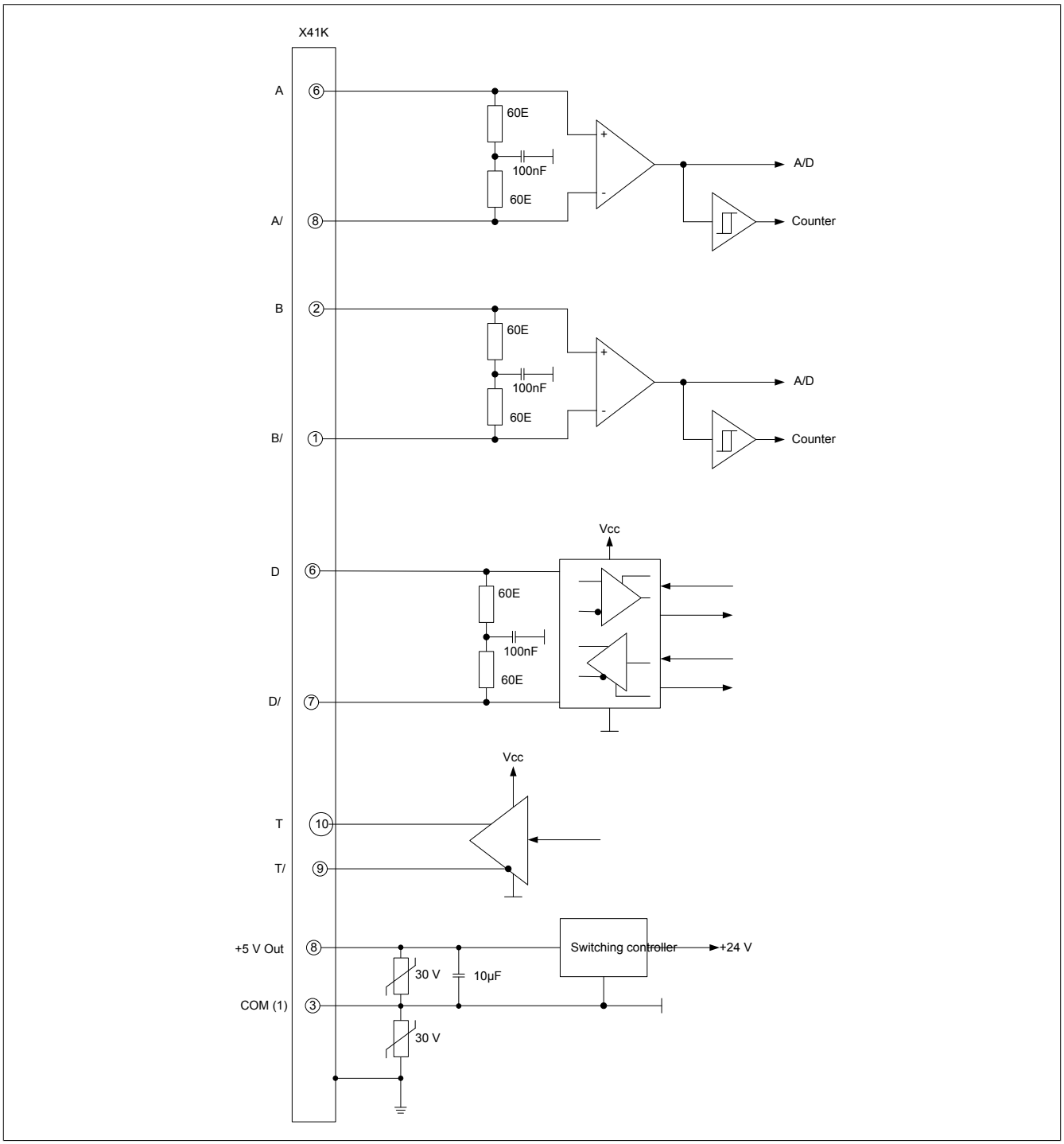
**The connections for the encoders are isolated circuits. These connections are therefore only permitted to be connected to devices or components that have sufficient isolation per IEC 60364-4-41 or EN 61800-5-1.**

# 5 Input/Output circuit diagram

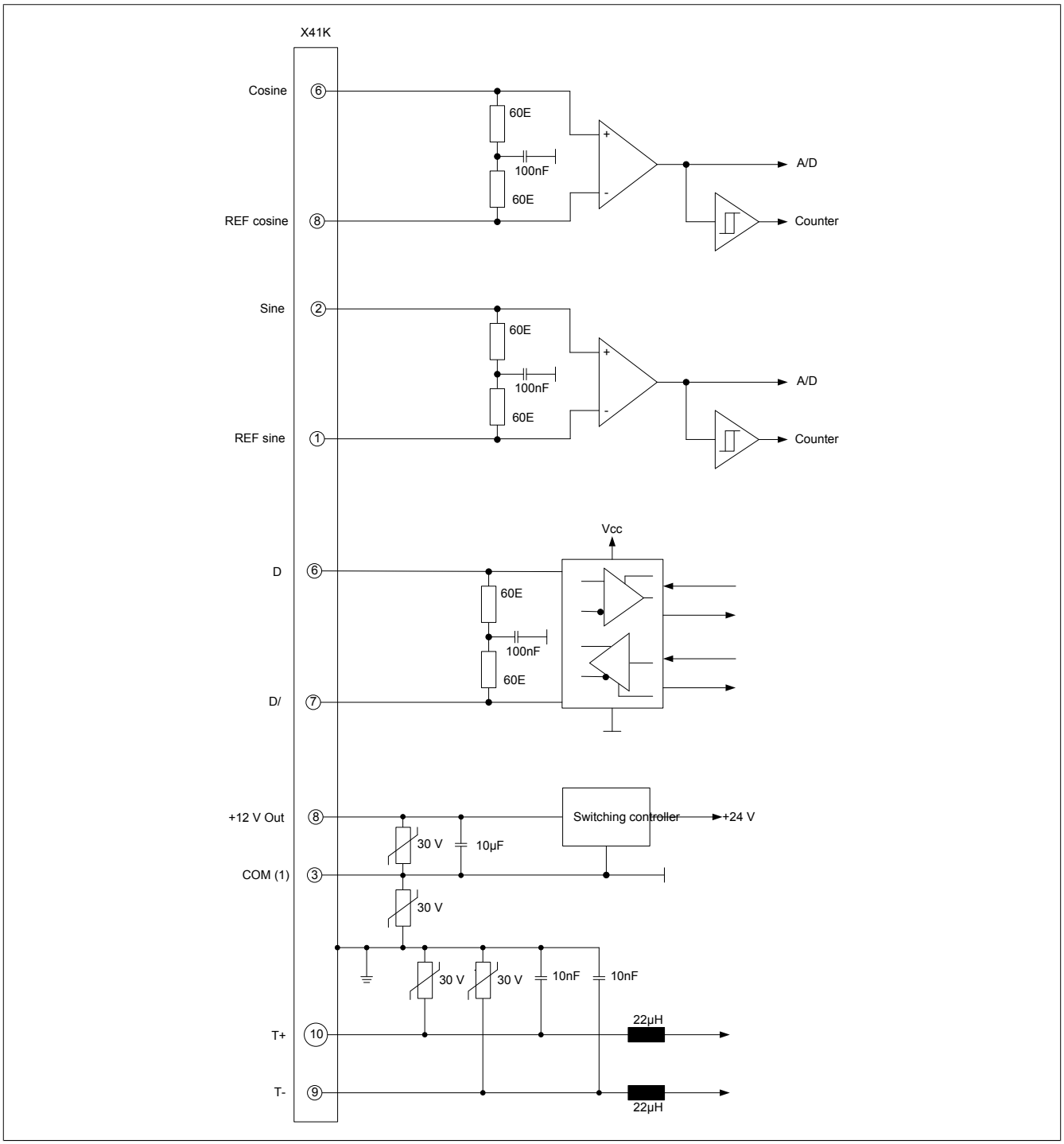
## SinCos



## EnDat 2.1 and SSI SinCos



## HIPERFACE


X41K
Cosine
6
60E
100nF
60E
A/D
Counter
REF cosine
8
Sine
2
60E
100nF
60E
A/D
Counter
REF sine
1
Vcc
D
6
60E
100nF
60E
D/
7
+12 V Out
8
Switching controller
+24 V
30 V
10µF
COM (1)
3
30 V
30 V
30 V
10nF
10nF
22µH
T+
10
T-
9
22µH