

## ***AP40 Display Controller***

### ***Suitable for:***

- **Displaying position and velocity**
- **Signal conversion**
- **Cam control**
- **Under/over speed monitoring**
- **Process time indication (1/f)**
- **Display for non-linear position and velocity**



### ***For sensors with:***

- **SSI - interface**
- **Incremental encodersignals**
- **Analog signals (current / voltage)**
- **Start/Stop signals**

**General**

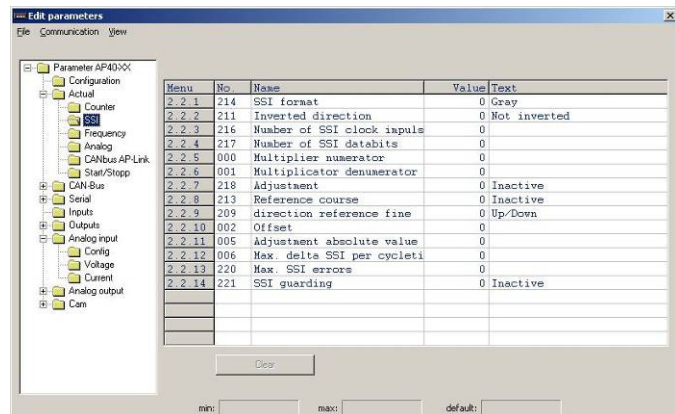
The AP40 is designed to display position and velocity, to be used as an electronic camshaft, to convert signals and has the abilities to solve complex and unusual applications. For this, the AP40 uses a sensor input that can handle various kinds of position signals. The position and velocity values can be adjusted through a set of parameters.

Main features:

- 8 digit display, digit height 10mm
- CAN bus, RS232, RS485 communication
- Analog input (optional)
- Inputs and outputs optically isolated
- 24 (dynamic) cams

**Programming**

The AP40 can be programmed by using the front keys. Another possibility is to use the PC-program DST40. This software allows easy access to and overview of all parameters. The settings of the display controller can be stored on your harddrive. The communications with the AP40 are ASCII based RS232; it is possible to connect the AP40 to other PC-software.

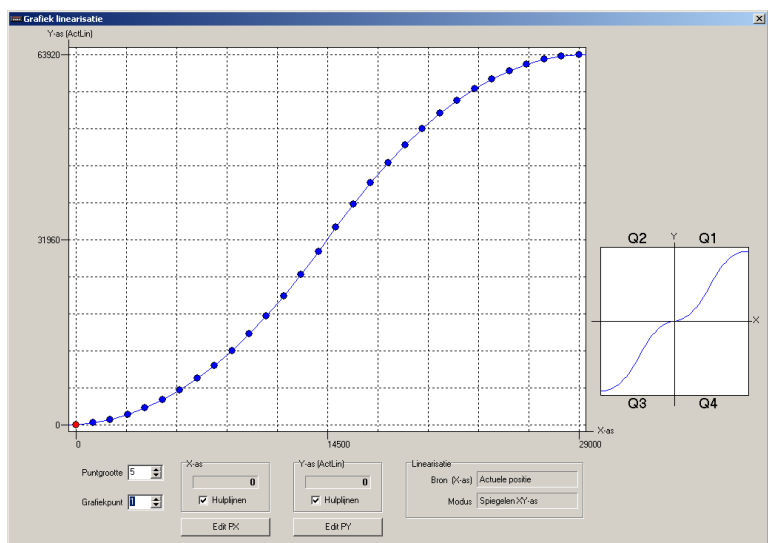


**Display for position and velocity**

The sensor value is adjusted by the programmable parameters. The value can be converted to any desired unit, e.g. mm, meters or mm/sec. This value can be displayed on the 8 digit display of the AP40. Based on the actual display limit values or cams can be programmed.

**Linearization function**

The AP20 has a very powerful linearization function and allows to display and process nonlinear motions. The actual display position or speed value is converted into an additional value "actual linearization". Interpolation takes place between these (max. 30) points. This additional value can also serve as a source for the cams function, analog output or data output.



**Signal conversion**

One of the unique possibilities of the AP40 is to convert the display value to a current or voltage. The range of the analog output is fully adjustable from -20..+20 mA or -10V..+10V. This feature makes it easy to convert for example the value of a SSI-encoder to an analog value.

**Cam controller**

It is possible to freely program a total of 24 cams. These cams can be assigned to 4 different outputs and can be compensated dynamically for dead-time. It is also possible to program the cams with a hysteresis.

The response time for the AP40 is no more than 250 microseconds (1 cycletime).

**Other features**

Many applications can be solved by using the display controller AP40. A few possibilities:

- Circumference measurement
- Process time indication
- Programmable counting range
- Cam generator
- Product length measurement

## Overview communication

### Sensors:

#### **SSI input**

Input for sensors with SSI. The number of clock pulses and number of databits can be programmed, as well as the code (Gray, binary).

#### **Incremental input**

Different types of signals can be connected to the input:

- 5 VTTL with marker pulse and inverted signals
- 5 VTTL without inverted signals
- 24 VHTL (A, B, N)
- S-signal: 24V blockpulse (1 channel) with a separate directional signal

#### **Analog**

The 16 bit analog input is freely programmable within the range of -20..+20mA or -10..+10V. This freedom offers the possibility to connect all regularly used signals: 0..±20mA, 4..20mA, 0..10V, 0.. ±10V and so on.

#### **Start/Stop**

The start-stop input is used for the linear displacement sensors from MTS Sensor Technologie. These sensors are easily connected to the AP40.

### CAN bus and AP-link

Multiple AP40 units can be connected to a CAN-bus. The AP-link protocol takes care of the communication between the units. This way the position and velocity data can be transmitted to other units.

### RS232/RS485 communication

The ASCII-protocol is used to communicate with the AP40. The PC-software DST40 uses this protocol to enable easy programming with the PC.

### Analog output

The optional analog output has a 16 bit D/A convertor. Both current or voltage are possible. The analog output is freely adjustable within the entire range of -20..+20mA or -10V..+10V.

### Logical inputs and outputs

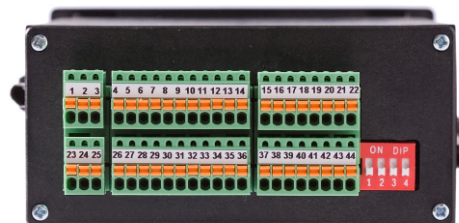
The AP40 has 4 digital inputs and 4 digital outputs.

For example the following functions can be assigned to the **inputs**:

- Reset error
- Keylock
- Start / stop cams
- Etc.

For example the following functions can be assigned to the **outputs**:

- Cams
- Error
- Cams active
- Etc.

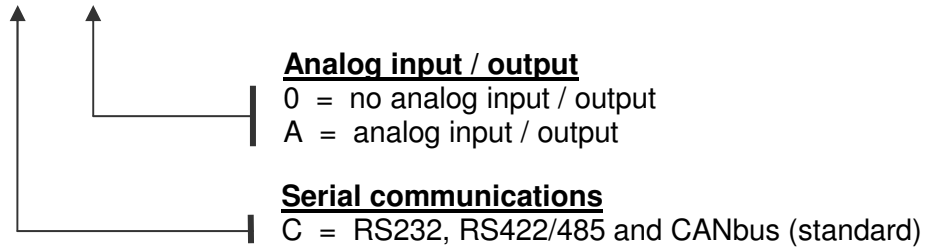


## Technical data

<b>Supply voltage</b>	10...35 V DC (without power failure) 16...35 V DC (with power failure)
<i>consumption</i>	< 150 mA (without sensor-consumption)
<b>Output voltage</b>	For external sensor
+ Ud	max 400 mA depending on supply voltage
+5V	max 400 mA
<b>Max. counting range</b>	-9999999...+99999999
<b>Cycle time</b>	250 µs (fixed)
<b>Incremental input</b>	Optically isolated
<i>Signal level</i>	Low (5V): 0...+0,8 V High (5V): +2,8...+5 V Low (24V): 0...+5 V High (24V): +15...+35 V
<i>Input resistance</i>	appr. 3K Ohm at 24 V appr. 0,35 Ohm at 5 V
<i>Input frequency</i>	Max. 150 kHz
<i>Impulswidth K0</i>	Min. 2 µs
<b>SSI</b>	Optically isolated
<i>clock-output</i>	driver according to RS422
<i>clock-frequency</i>	125 KHz (138,9 kHz if > 26 bit encoder signal)
<b>Digital inputs 1...4</b>	Optically isolated; low: 0...+5 V; high: +10 V...+35 V
<i>Input resistance</i>	Appr. 1.8 kΩ at 24 V
<b>Digital outputs 1...4</b>	Optically isolated, N FET, short-circuit proof; I <sub>max</sub> 500 mA
<i>Supply voltage</i>	35 V max.
<b>Voltage input</b>	Galvanically isolated; max. -10 V ... +10 V; 16 bit
<b>Current input</b>	Galvanically isolated; max. -20 mA ... +20 mA; 16 bit
<b>Voltage output</b>	Galvanically isolated; max. -10 V ... +10 V; 16 bit; I <sub>max</sub> ± 12 mA
<b>Current output</b>	Galvanically isolated; max. -20 mA ... +20 mA; 16 bit; R <sub>max</sub> 550 Ω
<b>Serial ports</b>	Ser-1 RS232 C Ser-2 RS422/485
<b>Display</b>	8 digit 7-segment LED; digit-height 10 mm
<b>Temperature range</b>	0...50 °C
<b>EMC</b>	According to EMC directive 2004/108/EC emission NEN-EN-IEC61000-6-3:2007 immunity NEN-EN-IEC61000-6-3:2005
<b>Weight</b>	< 0.4 kg
<b>Sealing</b>	front: IP50; rear: IP20

Typekey

AP40 - C X



Accessories

- CDS-B02 transparant protective DIN-hood with lock - IP54
- CDS-B22 transparant cover made from soft plastic - IP65 (keys accessible)
- EMC-B04 EMC-bracket to connect cables and shielding
- EM1016 USB/RS232 converter
- KBL006-002 RS232 cable 2m with 2x 9P sub-D connector

Scope of delivery

Connectors, 2 fixings and EMC-bracket are within the scope of delivery.  
A CD with manuals and software is included.

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