Technical instruction
ACS250 micro drives, 110-480 V
Configuring voltage and current reference inputs

Overview
The speed of the ACS250 can be controlled by either voltage based or current based reference signals. These signals can originate from a locally mounted potentiometer or from a remote intelligent control system (such as a PLC).

This technical instruction explains how the analog reference values are connected to the drive and how the drive is configured to understand the format of the signal it is receiving.

Parameters
1300: Analog input 1 (terminal 6) format
This parameter allows the user to configure the format of the signal connected to analog input 1. The following formats (table no. 1) on the right are supported.

<table>
<thead>
<tr>
<th>Text in display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U 0–10</td>
<td>Voltage input, 0 V-10 V (unipolar)</td>
</tr>
<tr>
<td>b -10–10</td>
<td>Voltage input, -10 V-10 V (bipolar)</td>
</tr>
<tr>
<td>A 0–20</td>
<td>Current input, 0 mA-20 mA</td>
</tr>
<tr>
<td>t 4–20</td>
<td>Current input, 4 mA-20 mA, drive trip (F0007) below 3 mA</td>
</tr>
<tr>
<td>r 4–20</td>
<td>Current input, 4mA-20 mA, drive stop below 3 mA</td>
</tr>
<tr>
<td>t 20–4</td>
<td>Current input, 20 mA-4 mA, drive trip (F0007) below 3 mA</td>
</tr>
<tr>
<td>r 20–4</td>
<td>Current input, 20 mA-4 mA, drive stop below 3mA</td>
</tr>
</tbody>
</table>

When set to 0–10 V all negative voltages will give zero speed. When set to -10–10 V all negative voltages will result in the drive running with negative (reverse) speed. Speed is proportional to the magnitude of the input voltage in both directions.

Typical configurations for the analog input (terminal 6) are shown on the next page.
Example 1
Local potentiometer using drive internal supply voltage
ACS250 is configured with the internal +10 V unipolar supply for connection to a local potentiometer.

1300=U 0–10

O: Stop (disable)  C: Run (enable)

Text in display
Description

Example 2
Remote signal reference (voltage source)
1300=U 0–10, b -10–10 (matched to source)

1304: Analog input 2 (terminal 4) format
This parameter allows the user to configure the format of the signal connected to analog input 2. The following formats (table no. 2) below are supported.

<table>
<thead>
<tr>
<th>Text in display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U 0–10</td>
<td>Voltage input, 0 V–10 V (unipolar)</td>
</tr>
<tr>
<td>A 0–20</td>
<td>Current input, 0 mA–20 mA</td>
</tr>
<tr>
<td>t 4–20</td>
<td>Current input, 4 mA–20 mA, drive trip (F0007) below 3 mA</td>
</tr>
<tr>
<td>r 4–20</td>
<td>Current input, 4 mA–20 mA, drive stop below 3 mA</td>
</tr>
<tr>
<td>t 20–4</td>
<td>Current input, 20 mA–4 mA, drive trip (F0007) below 3 mA</td>
</tr>
<tr>
<td>r 20–4</td>
<td>Current input, 20 mA–4 mA, drive stop below 3 mA</td>
</tr>
</tbody>
</table>

When set to 0–10 V all negative voltages will give zero speed.

Typical configurations for the analog input (terminal 4) are shown on the next page.
Example 1
Local potentiometer using drive internal supply voltage
ACS250 is configured with the internal +10 V unipolar supply for connection to a local potentiometer.

```
+24 V output
Digital input 1
Digital input 2
Digital input 3/
analog input 2
+10 V output
Analog input 1/
digital input 4
0 V
Analog output/
digital output
Relay common
Relay NO contact
```

```
Local potentiometer connection terminal 4, 6, and 7
```

```
Ensure wiper is not inadvertently connected to 0 V (T7) or 10 V (T5)
```

Example 2
Remote signal reference (voltage source)
1304=U 0–10 (matched to source)

```
+24 V output
Digital input 1
Digital input 2
Digital input 3/
analog input 2
+10 V output
Analog input 1/
digital input 4
0 V
Analog output/
digital output
Relay common
Relay NO contact
```

Example 3
Remote signal reference (current source)
1304=A 0–20, t 4–20, r 4–20, t 20–4, r 20–4 (matched to source)

```
+24 V output
Digital input 1
Digital input 2
Digital input 3/
analog input 2
+10 V output
Analog input 1/
digital input 4
0 V
Analog output/
digital output
Relay common
Relay NO contact
```

```
Remote signal reference input to drive from controller terminal 4 and 7
```

1302: Analog input 1 (terminal 6) scaling
This parameter is used to scale the analog input 1 prior to being applied as a reference to the drive. For example, if parameter 1300 is set for 0–10 V, and the scaling factor is set to 200.0 %, a 5 V input will result in the drive running at maximum speed.

1301: Analog input 1 (terminal 6) offset
This parameter defines an offset for the analog input 1, as a percentage of the full range of the input. A positive offset is deducted from the incoming analog signal and a negative offset is added to the signal.

For example, if 1300 is set for 0–10 V, and the analog offset is set to 10.0 %, then 1 V (10 % of 10 V) will be deducted from the incoming analog reference prior to it being applied within the drive.

Note that no offset or scaling options are provided for analog input 2.

9902: Digital input function select
Set for a function that gives analog input 1 control or selectable analog input 1/analog input 2 controls.