COMBIVERT EtherNet/IP COMBIVIS Setup

<table>
<thead>
<tr>
<th>Part</th>
<th>Version</th>
<th>Revision</th>
<th>Datum</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>en</td>
<td>1.0</td>
<td>001</td>
<td>2019-12-20</td>
<td>Draft</td>
</tr>
</tbody>
</table>

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Introduction
This document shows the steps to setup the EtherNet/IP communications for the S6-A and F6-A devices for firmware version 2.6.x and later. The device can be setup using COMBIVIS6. Using this program you can setup the IP Address and the Implicit data settings through the Fieldbus Wizard. You can use the default settings to get up and running. You can also customize your data if needed. Once the communications are setup it is advised to use the Application Programming Manual to learn how to control the drive.

- You can select the help tab in the menu to have a look at the COMBIVIS6 manual for a more detailed explanation on how to use the software.

COMBIVIS Diagnostic Communication Setup

- Verify hardware has been setup properly by following the guide. Connect the serial communication cable to X4A or the Ethernet cable to connector X4B or X4C and power up the device.
- Start up the KEB COMBIVIS6 program and create a new project. Give it a name and a Location to store it.

- Select the magnifying glass on the menu to scan for devices.

COMBIVIS New Project

COMBIVIS Scan for Devices
Verify the serial interface you have connected with or the Ethernet connection.

Select the “TCP/IP UDP” option if using the Ethernet connection and fill in the parameters. The default IP address is 192.168.1.100 and is shown here:

When connecting with Ethernet, verify that your PC’s IP Address is setup on the same sub network. To access both the Diagnostic Ethernet connection and the Fieldbus Network from your PC statically set the following parameters in your Local Area Connection on your PC.

Select “Start search…”

Select the device and add it to the project by clicking the “Add selected devices” button.
If the device is not found, verify that the hardware connections are correct and that the device is powered on. Also, check to see if another program on your PC is currently using the desired COM port.

The device will be added to the Navigator on the left as shown below. You can change the name of your device easily by clicking on the name to select it and clicking again to change it.

Double-click the device in the Navigator tree to open it in the Device Editor. From here you can adjust the settings of the device.
Parameter Setup

Once connected to the KEB drive the parameters can be changed for your application. COMBIVIS allows access to these drive parameters. Parameters are grouped together for different controls and modules. The most important parameters for the EtherNet/IP™ communication can be found in the Fieldbus parameter group.

- Click the “Device parameters” tab and locate the fb: fieldbus parameter group. You can type ‘f’ on the keyboard to use a shortcut to the group.
COMBIVIS Device Parameters

- Verify that fb68 is set to 6:EtherNet/IP.
- Adjust your diagnostic IP configurations in parameter fb108. Fill in the IP address and subnet mask with the values you would like to use. Only static configuration is available for this.
COMBIVIS Diagnostic IP Configuration

- Adjust your fieldbus address in parameter **fb109** if your configuration mode is static and the rotary switches are set to zero. By default the assignment is done via DHCP and will display the currently assigned values.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>fb108: IP address [1]</td>
<td>192.168.1.100</td>
</tr>
<tr>
<td>fb108: subnet mask [2]</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>fb108: gateway address [3]</td>
<td>0.0.0.0</td>
</tr>
</tbody>
</table>

COMBIVIS Fieldbus IP Configuration

- IP Address configuration follows the flow chart shown below:
Fieldbus IP Configuration

- Adjust the configuration method and select your assembly for control in fb113.
COMBIVIS Configuration Method & Assembly

- Reboot the device for the new values to become active.
- When making adjustments to the fieldbus parameters, always perform a restart of the device to ensure the correct fieldbus system and parameters get loaded for your application.

Fieldbus Wizard

The Fieldbus Wizard can be used to setup the Process data mapping for the Implicit Data communications on the fieldbus system. A default data mapping or a custom data mapping can be used. Follow the sections below for setup:

Default Mapping

The default settings are recommended for first time users. Follow the steps below to setup a default mapping.

- When using default mappings, it is the customer’s responsibility to verify that the data to and from the KEB device matches that of the PLC program. Verify data parameters, size, and data types before running an application.

- Click on the “Wizards” tab in the Device Editor window. Verify that your Fieldbus selection is set to EtherNet/IP.
- Click on the “Stored mappings” button on the lower right side of the Wizard screen.

- Load the standard PD mapping (F6/H6/S6)

- The mappings are displayed as follows:

- When the “Activate PDO” check boxes are filled, the process data is ready to transmit and receive.

- The standard default mapping is the following. It is used by both Assembly Instances Basic Speed Control 20/70 and KEB Control 100/101. This can be selected in fb113.
Process Data Input (Data going from Drive to PLC)

<table>
<thead>
<tr>
<th>Index</th>
<th>Size (Bytes)</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x6041</td>
<td>2</td>
<td>statusword</td>
<td>Current status of KEB device</td>
</tr>
<tr>
<td>0x6064</td>
<td>4</td>
<td>position actual value</td>
<td>Position value according to CiA402</td>
</tr>
<tr>
<td>0x606C</td>
<td>4</td>
<td>velocity actual value</td>
<td>Scaled velocity actual value</td>
</tr>
<tr>
<td>0x6061</td>
<td>1</td>
<td>modes of operation display</td>
<td>Shows the mode. Velocity mode is default.</td>
</tr>
<tr>
<td>0x6064</td>
<td>2</td>
<td>vl velocity actual value</td>
<td>Velocity Mode actual value</td>
</tr>
</tbody>
</table>

COMBIVIS PDIN Default

Process Data Output (Data going from PLC to Drive)

<table>
<thead>
<tr>
<th>Index</th>
<th>Size (Bytes)</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x6040</td>
<td>2</td>
<td>controlword</td>
<td>Control of device according to CiA402</td>
</tr>
<tr>
<td>0x607A</td>
<td>4</td>
<td>target position</td>
<td>Target position in position profile mode</td>
</tr>
<tr>
<td>0x60FF</td>
<td>4</td>
<td>target velocity</td>
<td>Target velocity</td>
</tr>
<tr>
<td>0x6060</td>
<td>1</td>
<td>modes of operation</td>
<td>Select mode of operation</td>
</tr>
<tr>
<td>0x6098</td>
<td>1</td>
<td>homing method</td>
<td>Select homing method</td>
</tr>
<tr>
<td>0x6042</td>
<td>2</td>
<td>vl target velocity</td>
<td>Target velocity in velocity mode</td>
</tr>
<tr>
<td>0x6081</td>
<td>4</td>
<td>profile velocity</td>
<td>Profile velocity value</td>
</tr>
<tr>
<td>0x6082</td>
<td>4</td>
<td>end velocity</td>
<td>Profile end velocity value</td>
</tr>
</tbody>
</table>

COMBIVIS PDOUT Default

Custom Mapping

Experienced users with familiarity of KEB devices have the option to setup custom data mappings. These can be saved, imported, and exported.

- When using custom mappings, it is the customer’s responsibility to verify that the data to and from the KEB device matches that of the PLC program. Verify data parameters, size, and data types before running an application.
- The fb113 Assembly Instance must be KEB Control 100/101 for custom mappings to be used. Basic Speed Control 20/70 does not support this.

Parameters can be dragged and dropped into the wizard. More info can be found in the application programming manual.

Application Assembly Parameters

KEB Control 100/101

The control and status word bits of the drive are shown below. They are explained in detail in chapter 4.
Motion Control in the Application Programming Manual.

### Control Word

<table>
<thead>
<tr>
<th>co00</th>
<th>controlword</th>
<th>Value</th>
<th>Plaintext</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>None</td>
<td>0</td>
<td>empty controlword</td>
<td>Waiting for control command</td>
</tr>
<tr>
<td>0</td>
<td>Switch on</td>
<td>1</td>
<td>switch on</td>
<td>State change to switch on in state machine</td>
</tr>
<tr>
<td>1</td>
<td>Enable Voltage</td>
<td>2</td>
<td>enable voltage</td>
<td>State change to enable voltage in state machine</td>
</tr>
<tr>
<td>2</td>
<td>No Quick Stop</td>
<td>4</td>
<td>no quick stop</td>
<td>Value of 0 activates quickstop</td>
</tr>
<tr>
<td>3</td>
<td>Enable Operation</td>
<td>8</td>
<td>enable operation</td>
<td>State change to enable operation to move the motor.</td>
</tr>
<tr>
<td>4</td>
<td>Operation Mode Specific</td>
<td>16</td>
<td>op. mode spec. 4</td>
<td>Definition depends upon the operating modes</td>
</tr>
<tr>
<td>5</td>
<td>Operation Mode Specific</td>
<td>32</td>
<td>op. mode spec. 5</td>
<td>Definition depends upon the operating modes</td>
</tr>
<tr>
<td>6</td>
<td>Operation Mode Specific</td>
<td>64</td>
<td>op. mode spec. 6</td>
<td>Definition depends upon the operating modes</td>
</tr>
<tr>
<td>7</td>
<td>Fault Reset</td>
<td>128</td>
<td>fault reset</td>
<td>Activates a reset to clear a drive error</td>
</tr>
<tr>
<td>8</td>
<td>Stop</td>
<td>256</td>
<td>halt</td>
<td>Stop is not supported in most operating modes</td>
</tr>
<tr>
<td>9</td>
<td>Operation Mode Specific</td>
<td>512</td>
<td>op. mode spec. 9</td>
<td>Definition depends upon the operating modes</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
<td>1024</td>
<td>Reserved</td>
<td>Reserved</td>
</tr>
<tr>
<td>11</td>
<td>Manufacturer Specific</td>
<td>2048</td>
<td>manufacturer spec. 11</td>
<td>Manufacturer specific use</td>
</tr>
<tr>
<td>12</td>
<td>Manufacturer Specific</td>
<td>4096</td>
<td>manufacturer spec. 12</td>
<td>Manufacturer specific use</td>
</tr>
<tr>
<td>13</td>
<td>Manufacturer Specific</td>
<td>8192</td>
<td>manufacturer spec. 13</td>
<td>Manufacturer specific use</td>
</tr>
<tr>
<td>14</td>
<td>Manufacturer Specific</td>
<td>16384</td>
<td>manufacturer spec. 14</td>
<td>Manufacturer specific use</td>
</tr>
<tr>
<td>15</td>
<td>Brake Control</td>
<td>32768</td>
<td>brake ctrl 15</td>
<td>Activates brake functions depending on co21 brake control mode settings</td>
</tr>
</tbody>
</table>

### Status Word

<table>
<thead>
<tr>
<th>st00</th>
<th>statusword</th>
<th>Value</th>
<th>Plaintext</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>None</td>
<td>0</td>
<td>empty statusword</td>
<td>Waiting for status</td>
</tr>
<tr>
<td>0</td>
<td>State Machine</td>
<td>1</td>
<td>ready to switch on</td>
<td>Display of state in State Machine</td>
</tr>
<tr>
<td>1</td>
<td>State Machine</td>
<td>2</td>
<td>switched on</td>
<td>Display of state in State Machine</td>
</tr>
</tbody>
</table>
2 State Machine 4 operation enabled Display of state in State Machine
3 Fault 8 fault 1 = fault
4 State Machine 16 voltage enabled 1 = Operating voltage in power circuit is OK
5 Quick Stop 32 no quick stop 1 = quick stop not active / 0 = quick stop active
6 State Machine 64 switch on disabled Display of state in State Machine
7 Warning 128 warning 1 = There is a warning status
8 Synchronous 256 synchron Indicates drive synchronous to fieldbus
9 Remote 512 remote 1 = Drive is controlled via bus
10 Target Reached 1024 target reached 1 = Target position or speed reached
11 Internal Limit 2048 internal limit active 1 = A limit has been reached
12 Mode Specific 4096 op. mode spec. 12 Setpoint acknowledge in pp-mode
13 Mode Specific 8192 op. mode spec. 13 Following error for positioning
14 Manufacturer Specific 16384 manufacturer spec. 14 Manufacturer specific use
15 Manufacturer Specific 32768 manufacturer spec. 15 Braking state for brake control

Status Word

**Basic Speed Control 20/70**

The breakdown of the CIP Basic Speed Control is shown below. It is a simple application setup for stop and go commands and setting the reference speed.

<table>
<thead>
<tr>
<th>Instance</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fault</td>
<td>Reset</td>
<td>Run</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fwd</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Speed</td>
<td>Reference (Low Byte)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Speed</td>
<td>Reference (High Byte)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Running</td>
<td>1</td>
<td>Faulted</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Faulted</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Speed</td>
<td>Actual (Low Byte)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Speed</td>
<td>Actual (High Byte)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assembly Basic Speed Control 20/70
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