Before Using the Product

Before using the product, please read this manual. Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

- Relevant manuals
Before using the product, please read the Safety Guidelines included with the base unit used, especially the following sections:
- SAFETY PRECAUTIONS
- CONDITIONS OF USE FOR THE PRODUCT
- EMC AND LOW VOLTAGE DIRECTIVES
- WARRANTY

For the product information, refer to the following:

- MELSEC iQ-R CPU Module User's Manual (Application)
- MELSEC iQ-R Module Configuration Manual
- MELSEC iQ-R CPU Module User's Manual (Startup)

For details, refer to the MELSEC iQ-R CPU Module User's Manual (Application).

- Functional safety evaluation was performed by TÜV Rheinland

Symbol Definition

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A*1</td>
<td>SIL2 Process CPU</td>
</tr>
<tr>
<td>B<em>2</em>4</td>
<td>Module set to operate in SIL2 mode connected to safety input devices</td>
</tr>
<tr>
<td>C<em>2</em>4</td>
<td>Module set to operate in SIL2 mode connected to safety output devices</td>
</tr>
<tr>
<td>D<em>1</em>2</td>
<td>Safety input device</td>
</tr>
<tr>
<td>E<em>1</em>4</td>
<td>Safety output device</td>
</tr>
</tbody>
</table>

*1 When performing safety communications between SIL2 Process CPUs on the safety path, add the PFDavg/PFH for SIL2 Process CPUs performing safety communications on the safety path. Add no PFDavg/PFH for SIL2 Process CPUs not performing safety communications on the safety path, even if they are on the same network.

*2 Calculate the PFDavg/PFH for SIL2 Process CPUs not performing safety communications on the safety path. Add no PFDavg/PFH for SIL2 Process CPUs not performing safety communications on the safety path, even if they are on the same network.

*3 Calculate PFH for SIL2 Process CPUs performing safety communications on the safety path. Add no PFH for SIL2 Process CPUs not performing safety communications on the safety path, even if they are on the same network.

*4 When the SIL2 application includes multiple safety input devices or safety output devices, perform the calculation by adding all PFDavg/PFH for the safety input devices, safety output devices, and modules, that are set to operate in SIL2 mode, connected to the devices.

*5 For SIL2-mode modules used in a SIL2 application configured with multiple inputs and outputs, multiply the PFDavg/PFH of these modules by the number of input points (a) and the number of output points (b) for the calculation.

== Calculation of the target failure measure (PFDavg/PFH) ==

The target failure measure (PFDavg/PFH) is a target value of reliability for each SIL level defined in IEC 61508: 2010 and IEC 61511: 2015.

When a system using the SIL2 Process CPU is configured, a SIL2 application shall configure a safety path, including safety input devices through safety output devices.

Calculate the PFDavg/PFH for each safety application using the following formula. If the safety path goes through the module set to operate in SIL2 mode multiple times, add the PFDavg/PFH for that module multiple times.

\[
PFD_{avg}/PFH = (PFD_{avg}/PFH of A) + (PFD_{avg}/PFH of B) \times 10^{3} \times (PFD_{avg}/PFH of C) \times 10^{5} + (PFD_{avg}/PFH of D) + (PFD_{avg}/PFH of E)
\]

Where:
- A = SIL2 Process CPU
- B = Module set to operate in SIL2 mode connected to safety input devices
- C = Module set to operate in SIL2 mode connected to safety output devices
- D = Safety input device
- E = Safety output device

== Monteux des modules ==

When installing the programmable controller in a control panel, fully consider its operability, maintainability, and environmental resistance. Securely mount all the MELSEC iQ-R series modules used on the base unit.

For details on the mounting method, refer to the MELSEC iQ-R Module Configuration Manual.

== Conditions d'utilisation de produit ==

Ce produit doit être utilisé dans les conditions suivantes :
- 0 to 60 °C (quand une unité de base à gamme de température élargie n’est pas utilisée)
- 0 to 55 °C (quand une unité de base à gamme de température élargie est utilisée)

See the following table for that module multiple times.

PFDavg/PFH = (PFDavg/PFH of A) + (PFDavg/PFH of B) \times 10^{3} \times (PFDavg/PFH of C) \times 10^{5} + (PFDavg/PFH of D) + (PFDavg/PFH of E)

<table>
<thead>
<tr>
<th>PFDavg/PFH</th>
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<tr>
<td>2 years</td>
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== Garantie ==

For further information and services, please consult your local Mitsubishi representative.