The following processing times are required for the PG500 to process data.
- In Prlogging procedure, Response wait time after the PG500 sends BCC - In Selecting procedure, Response wait time after the PG500 sends ACK or NAK.

**RS-422A/RS-485 fail-safe**
A transmission error may occur with the transmission line disconnected, shorted or set to the high-impedance state. In order to prevent the above error, it is recommended that the fail-safe function be provided on the receiver side of the host computer. The fail-safe function can prevent a framing error from occurring by making the receiver output states to the MARI (1) when the transmission line is in the high-impedance state.

**Modbus data processing precautions**
The numeric range of data used in the Modbus protocol is 0000H to FFFFH. Only the set value is written into an unused item.
- If read action to this item is performed, the read data will be “0.” If write action to this item is performed, no error message is indicated and no data is written.
- Commands should be sent at time intervals of 30 bits after the master receives the response message.
- Error code 1: Sequence error
  - Communication terminal number and signal details
- Error code 2: Request command error
  - Set value Data bit Parity
- Error code 3: Response code error
  - Set value Data bit Parity
  - Response send time after PG500 sends ACK 3 ms max.
  - Response wait time after PG500 sends NAK 1 ms max.
  - Response wait time after PG500 sends ENQ 3 ms max.
  - Response send time after PG500 receives ENQ 5 ms max.

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**Communication Instruction Manual (IMR02F04-E)**
The manual can be downloaded from the official RKC website:

[Website Link]

For the COM-K, refer to the COM-K Instruction Manual (IMR01214-E).

**Description of each parameters**
- **Engineering mode F60**
- **Setup setting mode**

**RS-485 (2-wire system) send/receive timing (RcIC communication)**
Query communication is conducted through two wires, therefore the transmission and reception of data requires precise timing.

**Communication settings**
- Communication speed: 1.2M bps, 2.4M bps, 4.8M bps, 9.6M bps, 19.2M bps
- 8n1, 7n1, 8n2, 7n2, 8o1, 8E2, 8o2
- Recommended tightening torque:
  - Communication terminal: M3 screw (4 kgf cm)
  - Recommended solderless terminals:
    - 7 (with 5.8 square washer)
    - 7e2
    - *R: Termination resistors (Example: 120Ω)

**Recommended tightening torque:**
- Communication terminal: M3 screw (4 kgf cm)
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**Maximum connections:**
- Up to 31 instruments

**Important notes:**
- Connect termination resistors.
- RS-422A multi-drop connection.
- In Modbus communication, communication is not possible if all the 7 data lines are set to high-impedance state.
- When the host computer (Master) has a USB connector, the read data will be “0.” If write action to this item is performed, no error message is indicated and no data is written.

**Commands should be sent at time intervals of 30 bits after the master receives the response message.**

**Error code 1:** Sequence error
- Communication terminal number and signal details
**Error code 2:** Request command error
- Set value Data bit Parity
**Error code 3:** Response code error
- Set value Data bit Parity
- Response send time after PG500 sends ACK 3 ms max.
- Response wait time after PG500 sends NAK 1 ms max.
- Response wait time after PG500 sends ENQ 3 ms max.
- Response send time after PG500 receives ENQ 5 ms max.
- Response send time after PG500 sends ACK 3 ms max.
- Response wait time after PG500 sends NAK 1 ms max.
- Response wait time after PG500 sends ENQ 3 ms max.
- Response send time after PG500 receives ENQ 5 ms max.

**Communication setting mode**
- Communication speed: 1.2M bps, 2.4M bps, 4.8M bps, 9.6M bps, 19.2M bps
- 8n1, 7n1, 8n2, 7n2, 8o1, 8E2, 8o2

**Ring terminal**
- Screw size: M3

**Maximum connections:**
- Up to 31 instruments

**Important notes:**
- Connect termination resistors.
- RS-422A multi-drop connection.
- In Modbus communication, communication is not possible if all the 7 data lines are set to high-impedance state.
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- 8n1, 7n1, 8n2, 7n2, 8o1, 8E2, 8o2
### Modbus RKC register

<table>
<thead>
<tr>
<th>Register address</th>
<th>Name</th>
<th>Data range</th>
<th>Factory set value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X00FA 250</td>
<td>Input type and factory set value table</td>
<td></td>
<td></td>
<td>Based on input type and factory set value table.</td>
</tr>
<tr>
<td>X00FC 253</td>
<td>Gain setting</td>
<td>0 to 153, 0.00300 to 199999/1000</td>
<td></td>
<td>Use a factory set value of 1.000.</td>
</tr>
<tr>
<td>Y00FE 258</td>
<td>PV display</td>
<td>0 to 143, 0.00000 to 999999.99900</td>
<td></td>
<td>Use a factory set value of 0.000.</td>
</tr>
<tr>
<td>Y00FF 259</td>
<td>Transmission output</td>
<td>0 to 143, 0.00000 to 999999.99900</td>
<td></td>
<td>Use a factory set value of 0.000.</td>
</tr>
</tbody>
</table>

#### Error code

<table>
<thead>
<tr>
<th>Error code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER 00EA 234</td>
<td>RKC communication input error</td>
</tr>
<tr>
<td>X00FD 253</td>
<td>X00FD 253</td>
</tr>
<tr>
<td>Y00FE 258</td>
<td>Gain setting</td>
</tr>
<tr>
<td>Y00FF 259</td>
<td>PV display</td>
</tr>
<tr>
<td>Y00FF 259</td>
<td>Transmission output</td>
</tr>
</tbody>
</table>

### 5. HOW TO USE MODBUS DATA MAPPING

In this communication, it is possible to continuously read/write data by freely specifying 10 sets of data.

- The register address of the "Modbus" data mapping is written to register address setting 1 (1001H).
- The register address of the "Alarm output state monitor" to be mapped is written to register address setting 4 (1002H).
- The register address of the "Alarm output state monitor" to be mapped is written to register address setting 4 (1003H).

#### Mapping data

- **Setting 1 (1001H)**
  - Data range: 0 to 1000H
  - Description: Set lock level LK 0105 261 R/W (RKC communication)

- **Setting 6 (1006H)**
  - Data range: 0 to 1000H
  - Description: PID set up LE 02BD 248 R/W (RKC communication)

### 6. COMMUNICATION SPECIFICATIONS

#### Communication speed:
- RS-422A: 4-wire system, half-duplex multi-drop connection
- RS-485: 2-wire system, half-duplex multi-drop connection

#### Communication code:
- RS-422A: 8-bit code (EIA-449 standard)
- RS-485: 7 or 8-bit code

#### Error control:
- Vertical parity (parity bit selected)
- Horizontal parity (BCC check)

#### Transmission signal format:
- Manchester code (AMS 232-1976 subcategories 2.5 and A4)
- Error control: Vertical parity (with parity bit selected)

#### Maximum connections:
- Up to 32 instruments

#### Data mapping function:
- Up to 16 items (Modbus)
- Up to 256 items (Modbus)

### Note:
- This item is valid when selecting a function for sensitivity adjustment by input pressure sensor.
- This item is invalid when the alarm type is set to "No Alarm".