HIMatrix

Safety-Related Controller

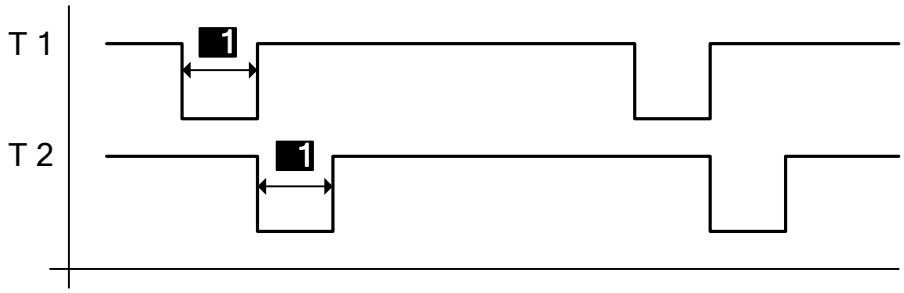
System Manual Modular Systems

HIMA Paul Hildebrandt GmbH

Industrial Automation

Rev. 2.02

HI 800 191 E



1 Configurable 5...2000 µs

Figure 2: Pulsed Signals T1 and T2

The digital outputs DO are pulsed (briefly set to low level), to monitor the wires connected to the digital inputs. The time base of the test pulse can be configured within 5...2000 µs (default value 400 µs).

i If line control is configured in a remote I/O, the remote I/O's watchdog time must be increased (default value 10 ms).

Line control detects the following faults:

- Cross-circuit between two parallel wires.
- Improper connection of two wires DO to DI, connection in contrast with the configuration specified in the software, e.g., DO 2 → DI 7 (configured), DO 2 → DI 6 (wired).
- Earth fault on one wire (with earthed ground only).
- Open-circuit or open contacts, i.e., including when one of the two EMERGENCY STOP switches mentioned above has been engaged, the *FAULT* LED blinks and the error code is created.

If such a fault occurs, the following reactions are triggered:

- The *FAULT* LED on the module's or device's front plate blinks.
- The inputs are set to low level.
- An (evaluable) error code is created.

If multiple faults occur simultaneously, the error code is the sum of all single fault error codes.

3.2 Supply Voltage Monitoring

The HIMatrix system is a single voltage system. In accordance with IEC/EN 61131-2, the required supply voltage is defined as follows:

Supply voltage	
Nominal value	24 VDC, -15...+20 % 20.4...28.8 V
Max. permissible function limits in continuous operation	18.5...30.2 V (including ripple)
Maximum peak value	35 V for 0.1 s
Permissible ripple	r < 5 % as r.m.s. value r_{PP} < 15 % as value peak-to-peak
Ground	L- (negative pole) Earthing the ground is permitted, see Chapter 7.2.6.1.

Table 11: Supply Voltage

- Overflow: Some events were not stored due to buffer overflow. The timestamp of the overflow event corresponds to that of the event causing the overflow.
- Init: The event buffer was initialized.

System events contain the SRS identifier of the device causing the events.

Status Variables

Status variables provide the user program with the state of scalar events. Each of the following states is connected to a status variable and can be assigned a global variable of type BOOL:

- Normal.
- Low limit (L) exceeded.
- Lowest limit (LL) exceeded.
- High limit (H) exceeded.
- Highest limit (HH) exceeded.

The assigned status variable becomes TRUE when the corresponding state is achieved.

3.5.3 Recording Events

The processor system records the events:

The processor system stores all the events in its buffer. The buffer is part of the non-volatile memory and has a capacity of 1 000 events.

If the event buffer is full, no new events can be stored as long as no further events are read and thus marked as to be overwritten.

3.5.4 Transfer of Events

The X-OPC server readout events from buffer and transfers this to a third-party system for evaluation and representation. Four X-OPC servers can simultaneously read events out of a processor module.

3.6 Product Data

Designation	Value, range of values
Power supply Power supply module	24 VDC, -15 %...+20 %, $r_{PP} \leq 15$ %, externally fused with 32 A
	Goldcap in the processor module (for buffering date/time)
Operating temperature	0...+60 °C
Storage temperature	-40...+85 °C
Type of protection	IP20 (unused slots covered, cover part no.: 60.528 2106)
Dimensions	260 mm x 312 mm x 245 mm (W x H x D)
Weight	max. 10 kg (completely assembled)

Table 14: Specifications of F60

The specifications for the module are detailed in the corresponding manuals.

3.7 Licensing with CPU 03

The following features of the controllers must be activated using a common license:

- Multitasking
- Reload
- Sequence of events recording

The software activation code can be generated on the HIMA website using the system ID of the controller (value 1...65 535). To this end, the **SMR** license must be activated.