



- Overspeed, limit- and positioning unit
- Absolute EnDat 2.2 encoder interface
- PROFINET interface for feedback values, configuration and diagnostics
- 3 programmable speed switches



General description

The SAFEWAY unit is a generic overspeed limit device. It is used to monitor the speed of a rotating axis, and upon detection of a breach of user configured limits, break up a circuit to stop a motor or to assert brakes.

The unit consists of three Overspeed alarm outputs and one general Error alarm output. For use as a part of an automated function the Error Alarm Output and Overspeed Output 2 should be connected in series as depicted in the figure below. These two alarm outputs cannot be bypassed by configuration and they have different polarity to decrease the risk of common cause failures.

The configuration of the speed limit settings is done via the PROFINET interface. This interface also provides feedback values (position, speed, acceleration, standstill information...) and diagnostic information for the automation control equipment. The SAFEWAY unit enters Off-line mode when the PROFINET connection is lost during operation or missing at startup.

The SAFEWAY unit reads the position from a Multi-turn EnDat 2.2 encoder placed on a rotating shaft and calculates the speed and acceleration based on the user provided scaling parameters.

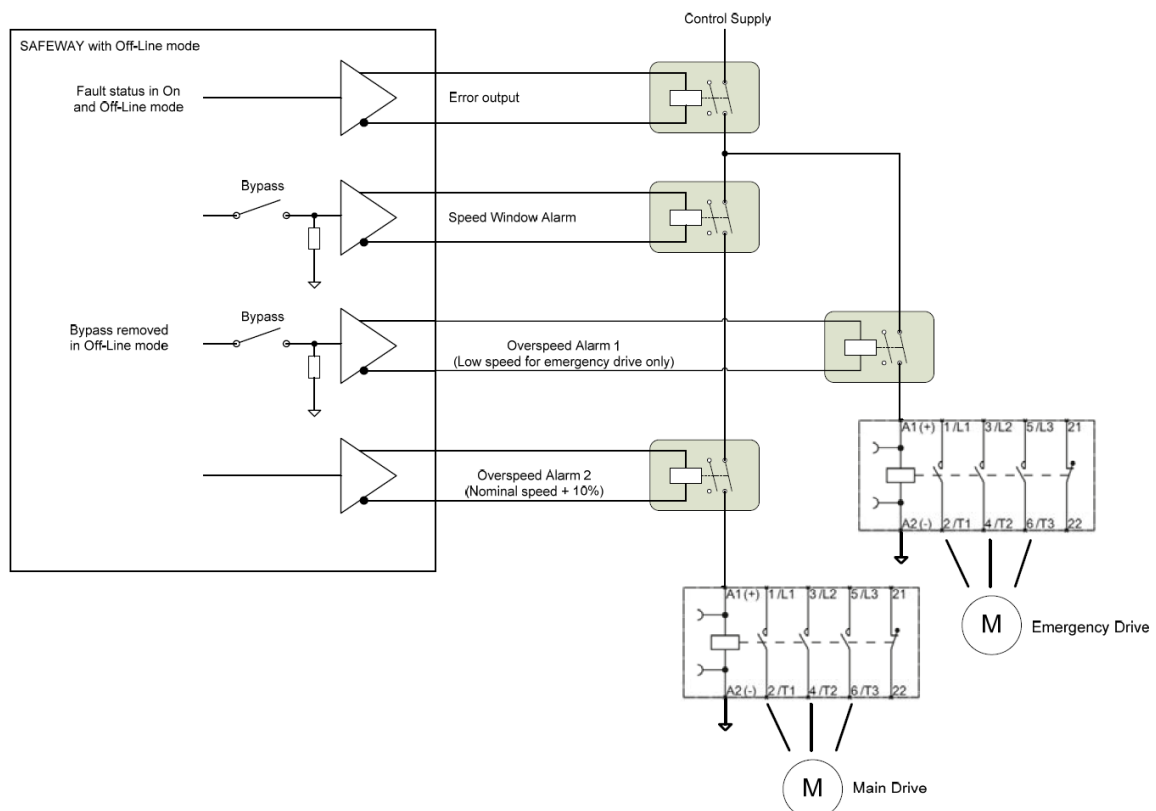


Figure: SAFEWAY unit and interfacing device

2022-08-08 Specifications can be changed without prior notice

General electrical specification

Supply voltage SAFEWAY	9-30 Vdc
Power consumption	5W
EnDat Input Interface	
Supply voltage to encoder	5 Vdc (Powered by SAFEWAY)
Signal type from encoder	EnDat 2.2
Cable length between encoder and gateway	50m (Max)
MTTF _d	5.349 x 10 ⁶ hours
Diagnostic coverage (DC)	71%

PROFINET Interface

Cable length	100m
Isolation of PROFINET interface	1500 Vdc
For comprehensive explanation of the PROFINET parameters and diagnostics advise the SAFEWAY application profile.	

Error output

Permissible load	20mA (Max)
Cable length (Max)	200m
Alarm types	System errors

Overspeed limits, outputs 1-3

Permissible load	20mA (Max)
Cable length (Max)	200m
Alarm types	Speed window, overspeed 1, overspeed 2, and overspeed 3

Mechanical specification

Housing	Aluminum
Mounting	Chassis
Temperature Operating	- 40°C ... +70°C
Temperature Storage	- 40°C ... +70°C
Protection class	IP 67
Vibration	< 100 m/s ² (55...2000 Hz)
Shock	< 1000 m/s ² (6 ms)

LED indication PROFINET

Bus	Module	Meaning	Cause
Off	Off	No power	
Red	Green	No connection to another device. Criteria: No data exchange	<ul style="list-style-type: none"> - Bus disconnected - Controller not available/ switched off
Blinking red	Green	Parameterization fault, no data exchange Criteria: Data exchange correct, however the encoder did not switch to the data exchange mode	<ul style="list-style-type: none"> - I/O device not configured yet or wrong configuration - Wrong station address assigned - Actual configuration of the slave differs from the nominal configuration
Green	Red	System failure	<ul style="list-style-type: none"> - Diagnosis exists, slave in data exchange mode
Green	Green	Data exchange and encoder functions properly	
Blinking* green	Blinking green	Firmware upgrade in process	
Blinking* red	Blinking red	Failure during firmware upgrade	
Red	Red	Missing EnDat encoder, No bus communication	<ul style="list-style-type: none"> - Connect EnDat encoder to gateway
Green	Orange	Warning present	<ul style="list-style-type: none"> - Command not supported

*) The blinking frequency is 0.5 Hz. Minimal indication time is 3 seconds.

Behavior of signals and outputs on fault conditions

Module status	Bus status	Encoder status	Alarm	Signal and output states
GREEN	GREEN	GREEN	GREEN	Normal operation
RED	GREEN	GREEN	GREEN	Error Alarm output active Speed alarms frozen
GREEN	RED	GREEN	GREEN	Error Alarm output active (Online mode) No PROFINET Data_exchange
GREEN	GREEN	GREEN	RED	Limit alarm set
GREEN	GREEN	GREEN	Blinking Green	Encoder preset not set Error Alarm output active

Pin configuration

Terminal on device	Function	Connector pin	Wire color
OUTPUTS			
M12 8 pin A-coded Male	Error Output Inverted	1	White
	Error Output	2	Brown
	Speed Window Alarm	3	Green
	Speed Window Alarm Inverted	4	Yellow
	Overspeed 1	5	Grey
	Overspeed 1 Inverted	6	Pink
	Overspeed 2	7	Blue
	Overspeed 2 Inverted	8	Red
INPUT			
M12 8 pin A-coded Female	Sense 0V	1	White
	Sense +V	2	Brown
	Data	3	Green
	Data Inverted	4	Yellow
	Supply 0V (Un)	5	Grey
	Clock Inverted	6	Pink
	Clock	7	Blue
	Supply +V (Up)	8	Red
POWER			
4 pin M12 A-coded Male	+EV	1	Brown
	0V	3	Blue
PORT 1			
5 pin M12 D-coded Male	Tx+	1	Yellow
	Rx+	2	White
	Tx-	3	Orange
	Rx-	4	Blue
PORT 2			
5 pin M12 D-coded Female	Tx+	1	Yellow
	Rx+	2	White
	Tx-	3	Orange
	Rx-	4	Blue

Ordering information

Part number	Description
1269601-01	ERG SAFEWAY PROFINET variant -01
1315950-01	PROFINET GSDML file for ERG SAFEWAY, GSDML-V2.35-LL-PN-SAFEWAY-20200110.xml.

Accessories

Encoders

Part number	Description
1110847-01	31 bit EnDat 2.2 solid shaft encoder, ISA 698 61 Ø10ro, 3.6-14V, 8pM12

Cables

Part number	Description	Port	Cable length
586238-03	Overspeed and error output cable	OUTPUT	2m
368330-15	Encoder input cable	INPUT	15m
586238-05	Power supply cable	POWER	2m
584404-01	PROFINET In (M12 - M12)	PORT 1/2	5m

Mechanical drawing

