

# Dupline® Modbus interface module with Safety mapping

## Type GSTI50



- Modbus-RTU slave.
- Originally designed for Dupline® Displays.
- cULus approved
- RS 485 port for interfacing to control system.
- 128 Digital I/O's.
- 25p Sub-D converter housing.
- Supplied by RS485 com-port

### Product Description

GSTI50 is originally designed as an interface solution for Dupline® GTD50 display, but can be used by all other Modbus-RTU masters. The GSTI50 supports Modbus- RTU function code "3" (read registers) and func-

tion code "16" (write registers), and can read/write all 128 Dupline® I/O's. The maximum numbers of registers that are allowed in 1 query are limited to 8 read registers or 8 write registers at a time.

### Ordering Key

**GSTI50**

Type: Dupline®  
Text Interface  
Type

### Type Selection

Supply	Ordering no.
By RS-485 Com-port	GSTI50

### Input/Output Specifications

Modbus-RTU	RS485 25-pole male SUB-D
Pin assignment	Pin 7: GND Pin 16: + 5 VDC Pin 10: TxRx- Pin 22: TxRx+
Baudrate	9600/19200
Parity	None
Databits/Stopbit	8/1
Current load typ.	45ma
Dielectric voltage RS485-Dupline®	> 2 kVAC (rms)
Dupline® Pin assignment	Pin 1: Dupline® Pin 2: GND
Adjustments DIP-switch 1 DIP-switch 2 DIP-switch 3 DIP-switch 4	Device address Baudrate Dupline® transmission Not used

### General Specifications

Power ON delay	< 2.0 s until start of Dupline® carrier
Indication for Communication Dupline fault	2/132 ms flash 1/4 sec flash
Environment Pollution degree Operating temperature Storage temperature	2 (IEC 60664) -20 to 60°C -50 to +85°C
Humidity (non condensing) Mechanical resistance Shock Vibration	20 to 80% 15 G (11 ms) 2 G (6 to 55 Hz)
Dimensions	55 x 70 x 15 mm
Weight	50 g
Approvals	IEC/EN 61508-SIL3 EN954 cat 4 TÜV Rheinland Group cULus

## Mode of Operation

The Dupline® GSTI50 Module is a Modbus-RTU slave interface module. 128 Dupline® I/O's can be read by a Master Control board master. More Dupline® GSTI50 can be connected to the same network and operate together in parallel with other modules using the same protocol. When the Dupline® GSTI50 Interface Module has received a telegram with Dupline® output-information to Dupline® Receivers, it will automatically respond with a telegram with Dupline® input-information to Dupline® Transmitters

### Safe Principles:

Each safety module is using 2 channel addresses to send its signal. The possible selections are in the range A3/A4... P7/P8.

Which channel address to be monitored by the safety module, must be defined. (Please note that the channel address A1/A2 is not allowed in the system. A1 is always used for safe synchronization between all safe modules).

It has the state of "0" when A1 is OK, and the state of "1" when A1 is faulty. A2 is surveillance of the Dupline® Bus. By the state "0", the Dupline Bus is OK and by the state "1" the Dupline Bus is faulty.

If all configured safety modules send a valid "safe-state" signal, every relay contact on the output-modules will be closed. In any other case - Non-safe signals

received from one or several safety modules or failure in the Dupline® bus, the relays will stay open and keep the system in "safe-state".

When starting up a safe-system, all contacts remain open until a valid "safe-state" signal is received from all safety modules.

If the Dupline® signal is missing or faulty, the GSTI50 will set the input status of all channels to OFF.

### Reaction time

The reaction time for the total Dupline® safety-loop depends of the number of Dupline® channels, and the responsetime from the GSTI50 = max. 136 mSec. The response time, of the

channels, can be calculated as:

*Reaction time on relay release (worst-case):* 2 x Number of Dupline® channels + 40 [ms]

Note: Reaction time is for the total Dupline® safety-loop; from a safety input goes to non-safe state until the output relay is released.

*Reaction time on relay activate (worst-case):* 4 x Number of Dupline® channels + 80 [ms].

Note: Reaction time is for the total Dupline® safety-loop; from a safety input goes to safe state until the output relay is activated.

## Memory Mapping

### Modbus-RTU Digital Input Register Mapping

Address	Dupline® Group (Word)	
	LOW BYTE	HIGH BYTE
010H	B	A
011H	D	C
012H	F	E
013H	H	G
014H	J	I
015H	L	K
016H	N	M
017H	P	O

Address	
0x10, HB bit 7	A1
0x10, Bit15	0 = synk-signal found 1 = synk-signal missing or interrupted
0x10, HB bit 6	A2
0x10, Bit 14	0 = Dupline Bus operating 1 = Dupline Signal missing
0x10, HB bit 54	Safety input 1
0x10, Bit 13, 12	00 = Safe and Valid 10 = Unsafe and Valid 11 = Unsafe and Invalid - Safe-Input not detected 01 = This combination can not occur.

## Pin Assignment

Pin	Signal
7	GND
10	TxRx-
16	+5V
22	TxRx+

## Switch Settings

### 1: Device Address

OFF: 1  
ON: 2

### 2: Baudrate

OFF: 9600  
ON: 19200

### 3: Dupline transmission

OFF: Off  
ON: On

### 4: Not Used

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