

# LON analogue/digital I/O modules



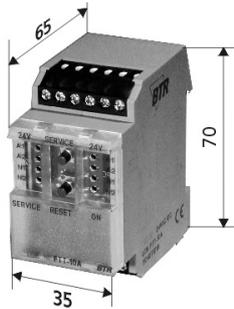
## LAM

24 V AC/DC, 2 analogue inputs, 2 analogue and 2 digital outputs

### Part Number

110 409 13

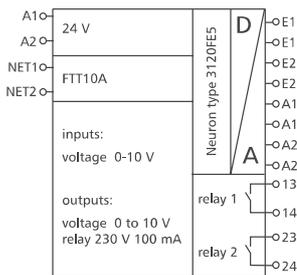
### Dimensions - C12 housing



### Wiring

23	24	E2	E2-	A2	A2-
A1	24 V AC/DC	A1			
A2	GND	A2			
N1	NET 1	N1			
N2	NET 2	N2			
13	14	E1	E1-	A1	A1-

### Wiring Diagram



### Note

The modules can be mounted in series without interspace. The max. number of modules connected in series is 15, each group needs an external power supply.

### Use

LON I/O module with 2 analogue inputs, 2 analogue and 2 digital outputs. Suitable to control for example vent valves and to issue an alarm signal at a preset threshold.

### Functional description

In a LON installation the different analogue outputs are activated proportionally by the network variables SNVT and accordingly issue a voltage between 0 and 10 Volt. Furthermore the outputs can be preset to specific voltages. The two digital outputs can be activated individually or subject to a preset threshold. In a LON installation the different inputs can be scanned simultaneously.

### LON interface

transceiver	FTT10A free topology
neuron	3120, 3k EEPROM downloadable
data format	standard network variables (SNVT)
transmission rate	78 kBit/s
max. length (see page 7)	
line topology	2700 m / 64 nodes
free topology	500 m / 64 nodes
cabling	twisted pair

### Application software

XIF and NXE files are available as downloads under [www.btr-electronic-systems.de](http://www.btr-electronic-systems.de).

### Technical data

#### Housing

dimensions w*h*l	35 x 70 x 65 mm
weight	82 g
mounting position	any
mounting	DIN rail according to EN 50022
material	housing + terminal blocks polyamide V0
	cover polycarbonate
	housing IP40
type of protection (DIN 40050)	terminal blocks IP20

#### Terminal blocks

supply and bus  
analogue inputs and analogue/digital outputs

#### Supply

2.5 mm <sup>2</sup>	
operating voltage range	20 ... 28 V AC/DC
current consumption	95 mA (AC) / 35 mA (DC)
duty cycle	100 %
recovery time	550 ms

#### Output

output voltage	0 ... 10 V DC
output current (10 V DC)	5 mA
resolution	10 mV
error max.	±100 mV
output contact	2 NO contacts
contact material	PhotoMOSRelais
switching voltage	40 V AC/DC
nominal current	100 mA
contact fuse	100 mA

#### Input

voltage input	0 ... 10 V DC
maximum resolution	11 V DC
error	10 mV (0.0 ... 100 %)
	about ±100 mV

#### Temperature range

operation	-5 °C ... +55 °C
storage	-20 °C ... +70 °C

#### Protective circuitry

operating voltage polarity reversal protection

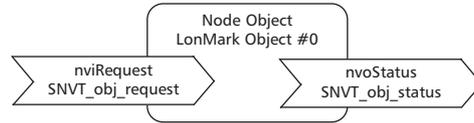
#### Display

operation green LED  
function yellow LED for status (service)

# LON analogue/digital I/O module

## Description of the LonMark objects and network variables

### LAM



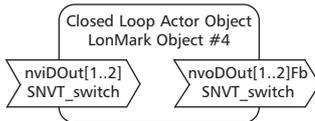
### Node Object

The Node Object monitors and controls the functions of the different objects in the device. It supports the basic functions Object Status and Object Request required by LonMark.

### Application Objects

The objects contain the functions status record of the analogue inputs, setting of the analogue or digital outputs and data exchange.

### DigitalOut Object



### DigitalOut Object

#### nviDOut[1..2] (index 2, 3)

SNVT type

Function

nviDOut[1..2] = 100.0 1

nviDOut[1..2] = 0.0 0

SNVT\_switch

switching of the outputs

digital output is closed

digital output is open

#### nvoDOut[1..2]Fb (index 4, 5)

SNVT type

Function

nvoDOut[1..2]Fb = 100.0 1

nvoDOut[1..2]Fb = 0.0 0

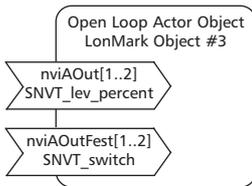
SNVT\_state

The output variables are issued after a change of the relay status

digital output is closed

digital output is open

### AnalogOut Object



### AnalogOut Object

#### nviAOut[1..2] (index 6, 7)

SNVT type

Function

nviAOut[1..2] = 0..100 %

SNVT\_lev\_percent

The outputs issue voltages according to the input variables.

0..10 V DC

#### nviAOutFest[1..2] (index 8, 9)

SNVT type

Function

nviAOutFest[1..2] = 100.0 1

nviAOutFest[1..2] = 0.0 0

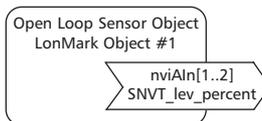
SNVT\_switch

switching of the outputs to preset voltage values

Ausgang[1..2] = nciFestwert[1..2]

Ausgang[1..2] = nviAOut[1..2]

### AnalogIn Object



### AnalogIn Object

#### nvoAln[1..2] (index 10, 11)

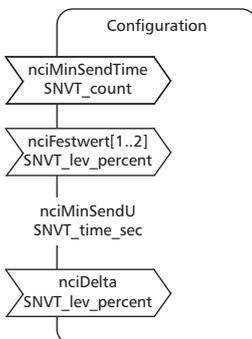
SNVT type

Function

SNVT\_lev\_percent

Voltages between 0 and 10.0 Volt DC are measured at the inputs and issued to the LON bus.

### Configuration variables



### Configuration Variables

#### nciMinSendTime (index 12)

SNVT type

Function

SNVT\_count

All output variables described above are issued even without status change at the end of a preset period of time. Thus the device reports periodically to the system.

Time settings

0 timer function off-state

1 .. 60 timer time in seconds (factory setting 0)

#### nciFestwert[1..2] (index 13, 14)

SNVT type

Function

SNVT\_lev\_percent

If a value is entered in nciFestwert[1..2] and if nviAOut[1..2] exceeds this value, relay [1..2] is activated. If nviAOut[1..2] remains under this value, relay [1..2] turns off with a hysteresis of 5 %.

If nciFestwert[1..2] = 0 the digital output [1..2] responds only to nviDOut[1..2].

Constant value settings

10 ... 90 % (factory setting 0)

#### nciMinSendU (Index 15)

SNVT Type

Function

Time settings

SNVT\_time\_sec

assured transmitting pause between two voltage values

0 timer function off-state

1 ... 6553 timer time in seconds (factory setting 0)

#### nciDelta (Index 16)

SNVT Type

Function

SNVT\_lev\_percent

The voltage values are only transmitted when a defined voltage change is overrun or underrun.

Example: nciDelta = 5 %, module transmits only if voltage changes by 0,5 Volt.

Percentage settings

0 ... 100 %