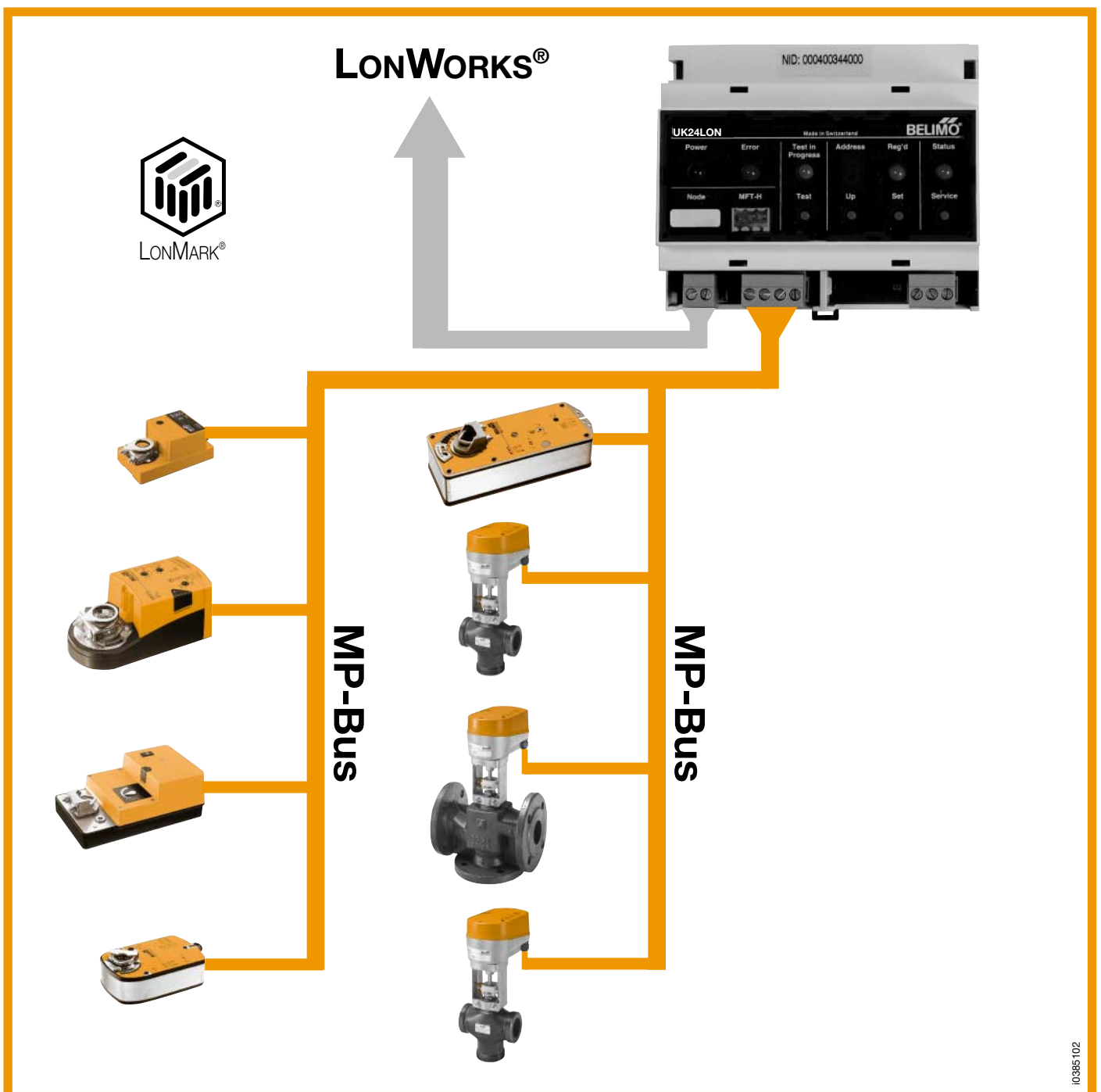



2. + 4. + 6. UK-1

Product Information

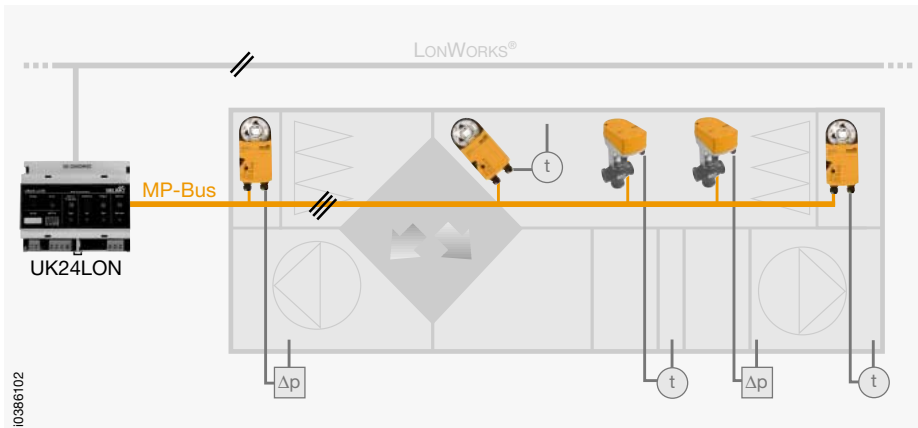
MP/LonWorks® UK24LON Gateway

UK



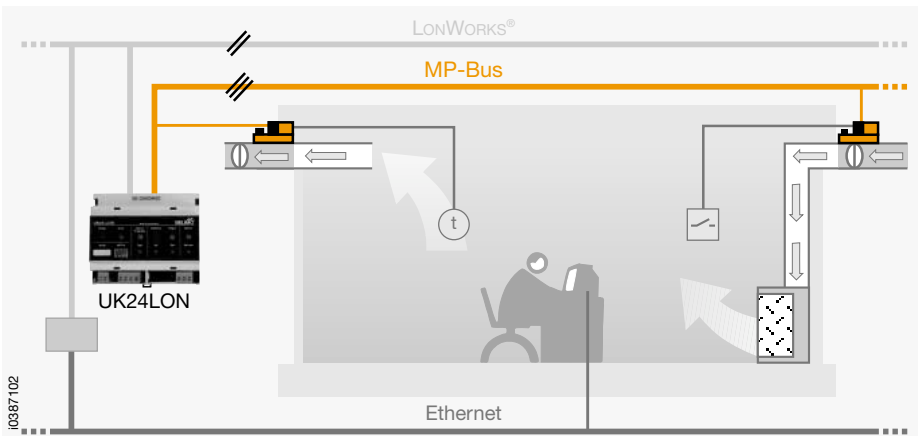
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Example 1: Connecting the actuators and sensors in the plant room of a central ventilation system to LONWORKS® via a UK24LON unit



The plant room of a central ventilation system employing Belimo MFT2 actuators (for air dampers and valves) can be bus-linked to LONWORKS®. A UK24LON unit (MP/LON Gateway) is used to link the MP-Bus-capable MFT2 actuators and the sensors that are connected to them to the LONWORKS® system.

Example 2: VAV-Control with a link to LONWORKS®




VAV air volume controllers for supply air and exhaust air employing VAV-Compact NMV-D2M motorised actuators can be linked together via an MP-Bus. The NMV-D2M actuators and the sensors connected to them (proximity and temperature sensors) are linked to LONWORKS® through a UK24LON unit (MP/LON Gateway). Individual operators can use their PC's to interrogate actual room temperatures or to issue or change temperature settings. The PC's are on an Ethernet network and linked to LONWORKS® through a router.

□ ○ Various sensors

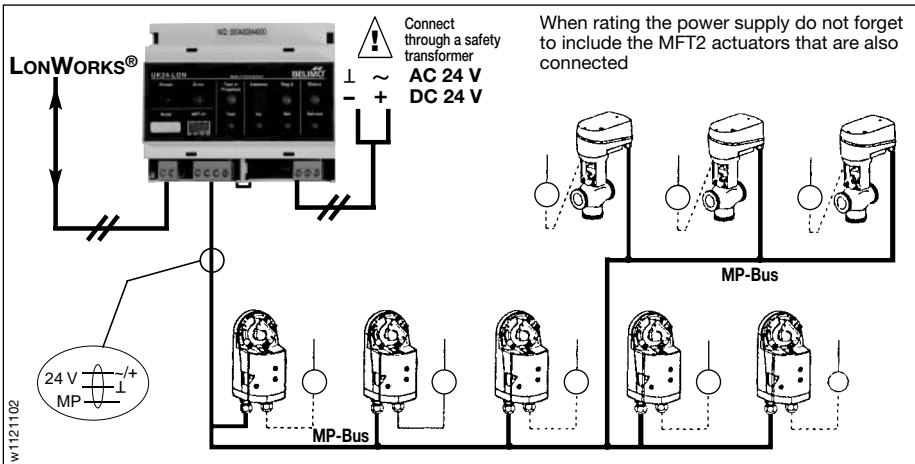
≡ Power supply and communication via 3 conductors only

≡ Communication via 2 conductors

 Damper actuator AM24-MFT2

 Globe valve actuator NV24-MFT2

 VAV-Compact NMV-D2M



Technical data	UK24LON unit
Power supply	AC 24 V 50/60 Hz, DC 24 V
Functional range	AC 19.2...28.8 V, DC 21.6...28.8 V
For wire sizing	3 VA (without MFT2 actuators connected)
Power consumption	1.5 W
Connections	LONWORKS®: push-screw terminals, 2-pole Power: push-screw terminals, 3-pole MFT2 actuators: push-screw terminals, 4-pole (all terminals for 2 x 1.5 mm ²) MFT-H: plug socket, 3-pole (for connect. MFT-H or PC via ZIP-RS232 interface)
Processor/Memory	Neuron 3150®; 10 MHz; 48 kb flash memory, 8 kb RAM
Transceiver	FTT-10A compatible with LPT-10
Functional Profile	Damper actuator 8110; see Page 8 For further detailed information refer to the LONMARK® web site (www.lonmark.org)
Plug-in (configuration software)	The following are available for LonMaker 2.0: Modifiable – MFT2 actuator addresses with Plug-in: – Min./Max. limits – Definition of sensors connected to the MFT2 actuators
Communication with MFT2 actuators	Belimo MP-Bus: Master-Slave system 1200 Baud
No. of MFT2 actuators	up to 8 actuators can be connected
Maximum MP conductor length	Depends on the number of MFT2 actuators connected, the types of actuators, the type of power supply and the cross sectional area of the conductor. Refer to the diagram on Page 7.
LONWORKS® conductor lengths and transmission media	In accordance with Echelon recommendations
Ambient temp. range	0 °C ... +50 °C
Protection class	⚡ (safety extra-low voltage)
Degree of protection	IP20
EMC	CE in accordance with 89/336/EU, 92/31/EU, 93/68/EU
Mounting	DIN rail 35 mm
Weight	ca. 500 g

MP Gateway to LonWorks®

- MP/LON interface
- MFT2 actuators (with MP communications capability) linked to LONWORKS® through a UK24LON unit
- Up to 8 actuators can be connected
- LONMARK® certified

Application

The UK24LON unit is a Belimo gateway that has been certified by LONMARK®. It allows the Belimo MP-Bus to be linked to LONWORKS®.

Up to 8 MFT2 actuators can be connected to the MP-Bus side of the system (MFT2 damper actuators, MFT2 valve actuators and VAV-Compact controllers NMV-D2M).

Mode of operation

Through the UK24LON unit the actuators can be controlled digitally over the MP-Bus and they also provide feedback of their current operating status. In the UK24LON unit the digital data for control and feedback is converted to standard network variables (SNVT's). This allows the functions of the actuators to be linked directly to LONWORKS®.

Sensor connection

One sensor can be connected to each MFT2 actuator. It can be either a passive resistance-type sensor (Pt1000, Ni1000 or NTC), an active sensor (e.g. with a DC 0...10 V output) or a switching contact. This provides a simple means of digitising the analogue signal from the sensor through the actuator so that it can be passed on to LONWORKS® via the UK24LON unit.

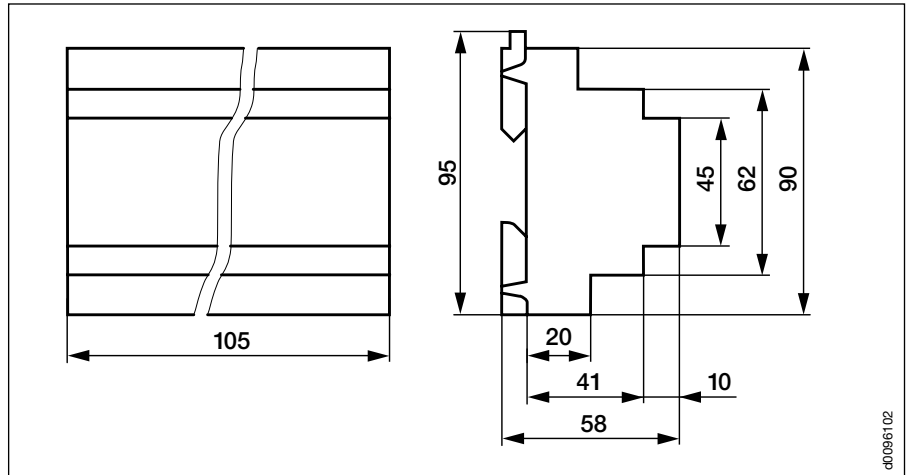
Parameterizing MFT2 actuators

Using the Belimo PC-Tool and the MFT-H manual parameter assignment device it is very easy to preset specific parameters (e.g. running time) for individual actuators. The MFT-H or the PC (via ZIP-RS232 interface) can be connected to the 3-pole plug socket of the UK24LON unit.

Important installation note!

Do not energize the system (UK24LON and actuators) until all the wiring has been finished.

UK24LON unit dimensions



UK24LON

Bus-capable MFT2 actuators with MP-Bus

connectable to LONWORKS® through a UK24LON unit.

Damper actuators		without safety function			with safety function	
Torque	standard	8 Nm	18 Nm	36 Nm	4 Nm	15 Nm
	variable	•	•	•	–	–
Rated voltage	AC / DC 24 V	•	•	•	•	•

Actuators for globe valves		without emergency control function		with emerg. contr. function	
Actuating force	standard	800 N	2000 N	800 N	800 N
	variable	•	•	–	–
Emergency control function		–	–	retracting	extending
Rated voltage	AC / DC 24 V	•	•	•	•

VAV-Compact:

Dynamic differential-pressure sensor with controller and damper actuator



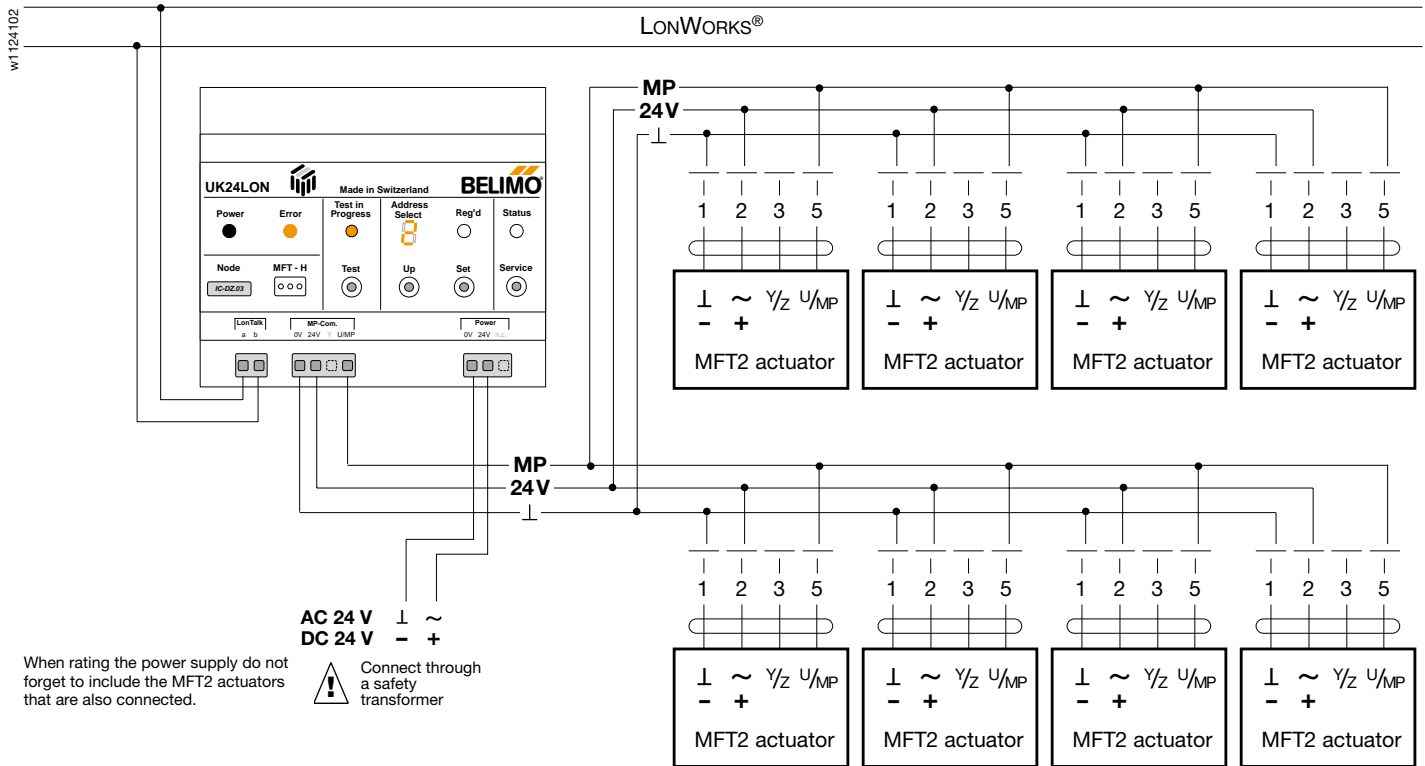
NMV-D2M

Torque	standard	8 Nm
	variable	•
Rated voltage	AC / DC 24 V	•

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Connecting MFT2 actuators

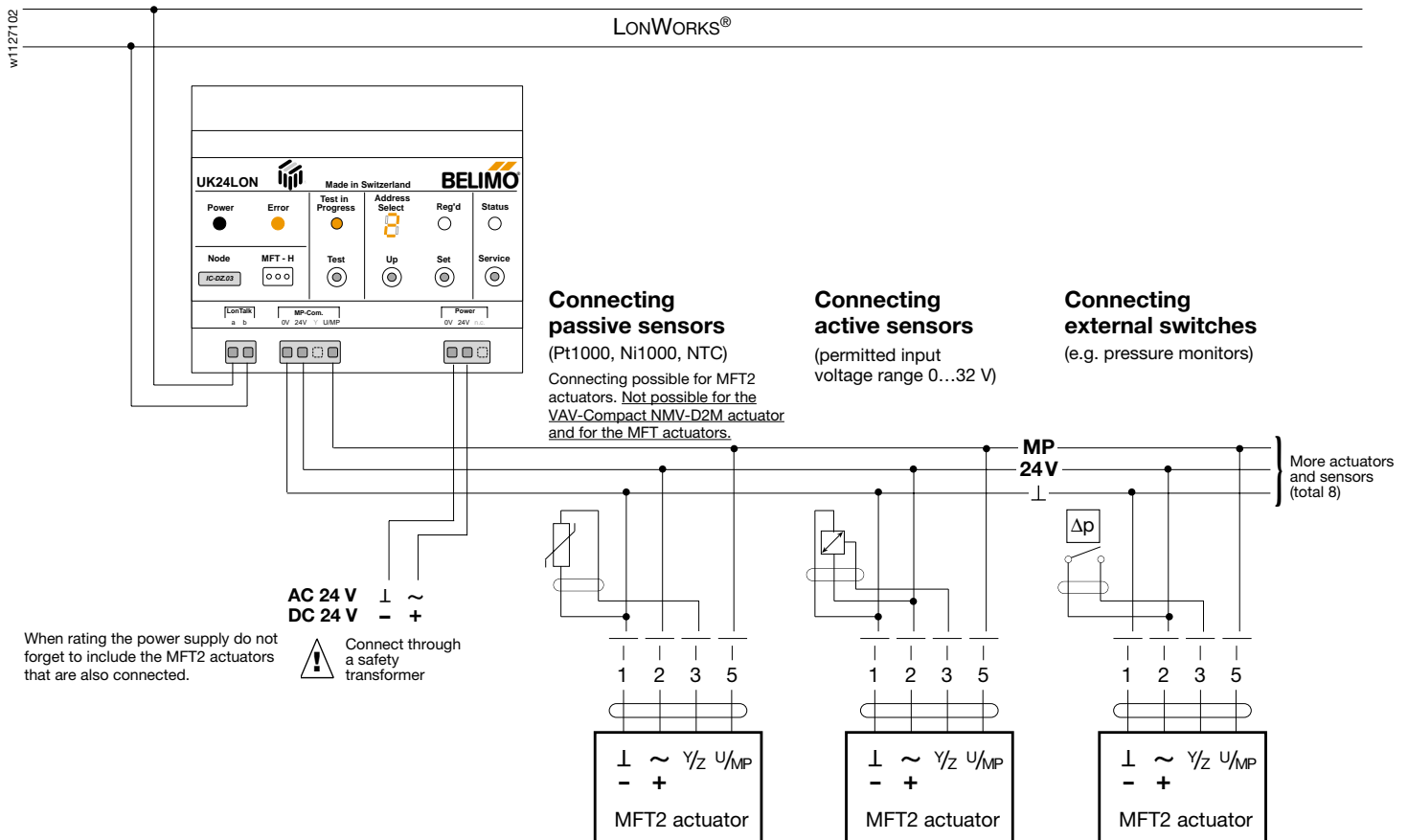


Connecting sensors

One sensor can be connected to each MFT2 actuator. It can be either a passive resistance-type sensor (Pt1000, Ni1000 or

NTC), an active sensor (e.g. with a DC 0...10 V output) or a switching contact. This provides a simple means of digitising the

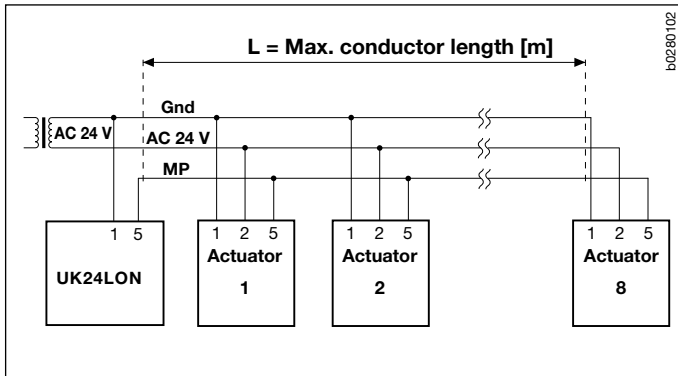
analogue signal from the sensor through the actuator so that it can be passed on to LONWORKS® via the UK24LON unit.



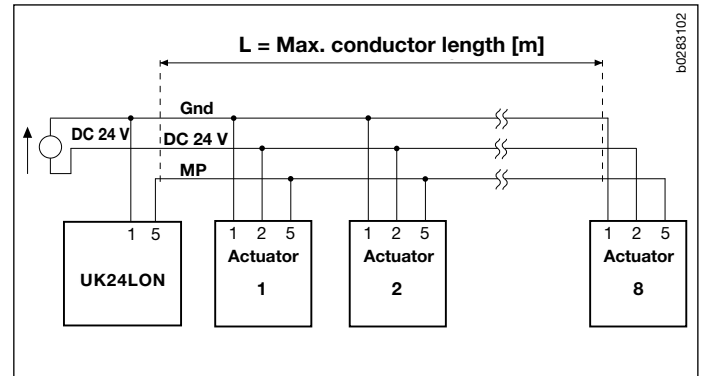
Connecting the MP-Bus

- The network employs a 3-pole connection (MP communication and 24 V power supply).
- Up to 8 MFT2 actuators can be connected to each network.
- No special cable or terminating resistors are needed.
- Conductor lengths are limited (see below for methods of calculation)
 - by the total power rating of the MFT2 actuators that are connected,
 - by the type of power supply (AC 24 V or DC 24 V via the bus),
 - by the cross sectional area of the conductor.

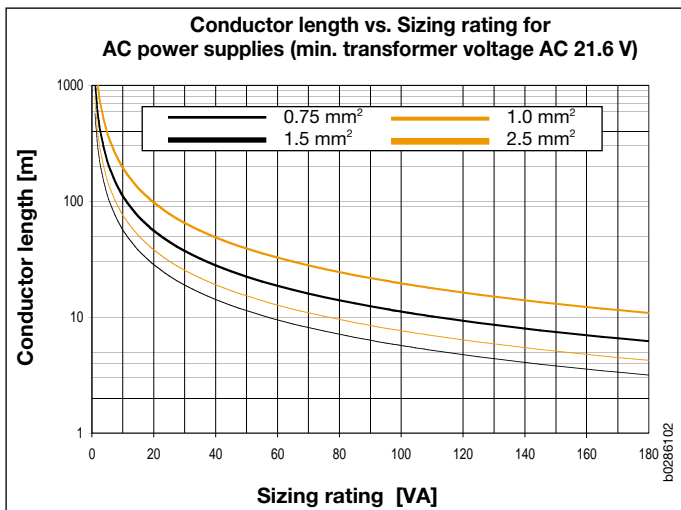
Maximum conductor length for AC 24 V



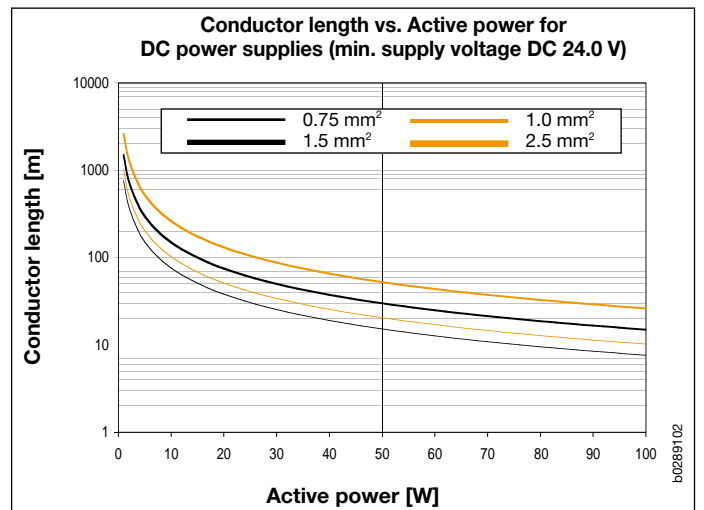
Maximum conductor length for DC 24 V



Total power rating of MFT2 actuators [VA]



Total power rating of MFT2 actuators [W]



! In the case of the NVF24-MFT2 the sizing rating must be multiplied by 2.

Conductor length vs. Active power for DC power supplies (min. supply voltage DC 24 V).

Calculating maximum conductor lengths

First add together the power ratings [VA] of the MFT2 actuators that are being used and then read off the corresponding conductor lengths from the diagram.

Example:

Connected to the MP-Bus are: 1 in No. NM..., 1 in No. AM..., 1 in No. AF.. and 1 in No. NV...

Total power rating:

$3 \text{ VA} + 5 \text{ VA} + 10 \text{ VA} + 5 \text{ VA} = 23 \text{ VA}$

Read off from the curves:

- Cable with core Ø 0.75 mm² gives: **cable length 25 m**
- Cable with core Ø 1.00 mm² gives: **cable length 33 m**
- Cable with core Ø 1.50 mm² gives: **cable length 50 m**
- Cable with core Ø 2.50 mm² gives: **cable length 85 m**

Calculating maximum conductor lengths

First add together the power ratings [W] of the MFT2 actuators that are being used and then read off the corresponding conductor lengths from the diagram.

Example:

Connected to the MP-Bus are: 1 in No. NM..., 1 in No. AM..., 1 in No. AF.. and 1 in No. NV...

Total power rating:

$1.3 \text{ W} + 2.5 \text{ W} + 6.0 \text{ W} + 3.0 \text{ W} = 12.8 \text{ W}$

Read off from the curves:

- Cable with core Ø 0.75 mm² gives: **cable length 60 m**
- Cable with core Ø 1.00 mm² gives: **cable length 80 m**
- Cable with core Ø 1.50 mm² gives: **cable length 115 m**
- Cable with core Ø 2.50 mm² gives: **cable length 200 m**

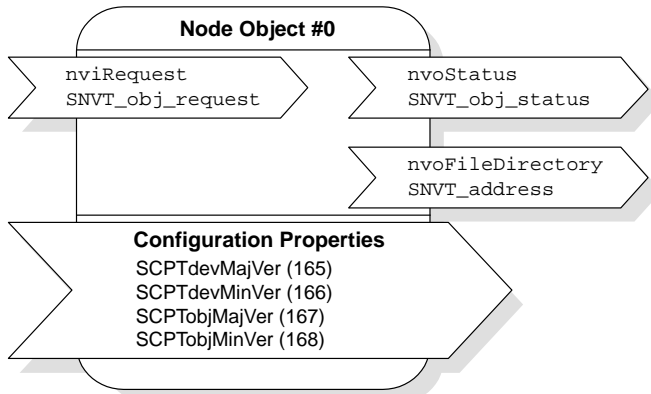
Maximum conductor length with a local AC 24 V power supply

Note: If the actuators are fed with a local AC 24 V power supply from a separate transformer it is possible for conductor lengths to be substantially greater. Regardless of the power ratings of the actuators connected to the UK24LON unit the conductor lengths are then as stated in the adjacent table.

Core Ø mm ²	L = Max. conductor length [m]
0,75	800
1,0	
1,5	
2,5	

LONMARK® Functional Profile

The UK24LON unit can link a maximum of 8 MFT2 actuators with an MP-Bus capability to LONWORKS®. The UK24LON Gateway converts the digital communications processes of the MP-Bus to standard LONMARK® network variables.



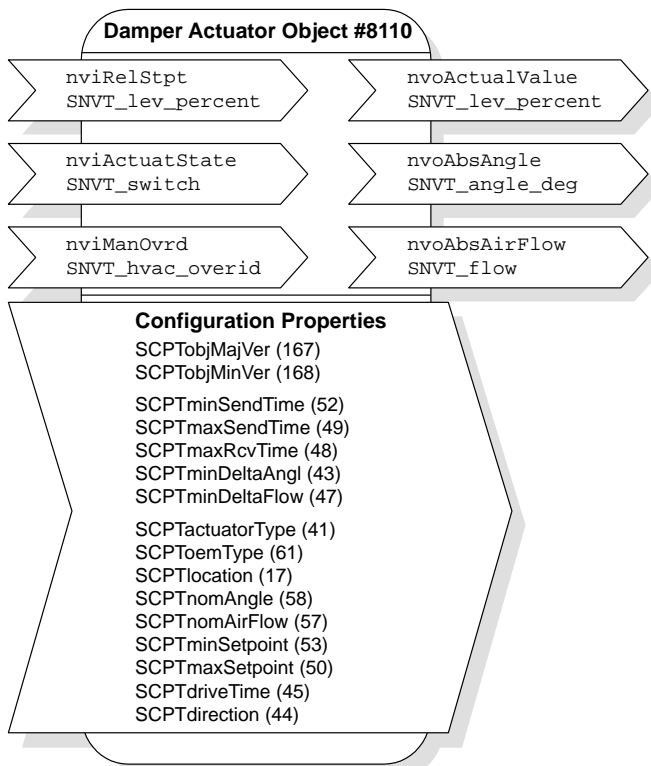
Node Object #0

Node Object contains the functions Object Status and Object Request.

nviRequest **SNVT_obj_request**
Input variable, demands the status of a specific object in the node.

nvoStatus **SNVT_obj_status**
Output variable, gives the actual status of a specific object in the node.

nvoFileDirectory **SNVT_address**
Output variable, indicates information in the address area of the Neuron chip.



Damper Actuator Object #8110

The actuator object shows the functions of the MFT2 actuators on the LONWORKS® network side. The UK24LON unit implements 8 of these objects (one for each MFT2 actuator, see next page).

nviRelStpt **SNVT_lev_percent**
This input variable gives the actuator its reference position or set-point. The variable is normally linked to the output variable of an HVAC controller.

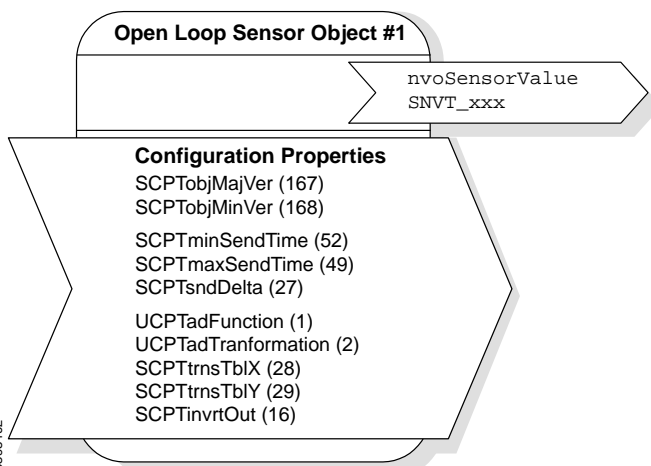
nviActuateState **SNVT_switch**
This input variable gives the actuator a preset position. Note on priority: whichever variable, nviActuatState or nviRelStpt, was last active takes priority.

nviManOvrd **SNVT_hvac_overid**
This input variable allows manual overriding of the actuator to a specific position (the function is only active if preceded by RQ_OVERRIDE). The function is typically used during the commissioning of installations.

nvoActualValue **SNVT_lev_percent**
This output variable shows the actual position of the actuator and can be used for resetting control circuits or for indicating position.

nvoAbsAngle **SNVT_angle_deg**
This output variable shows the actual angle of rotation of the actuator or damper blade and can be used for indicating position or for servicing purposes (not for the NMV-D2M or linear actuators).

nvoAbsAirFlow **SNVT_flow**
This output variable shows the actual volumetric flow through the appropriate box and can be used for control and indicating purposes (NMV-D2M only).



Open Loop Sensor Object #1

One sensor can be connected to each MFT2 actuator. It can be either a passive resistance-type sensor (Pt1000, Ni1000 or NTC), an active sensor (e.g. with a DC 0...10 V output) or a switching contact. The measured sensor values are transferred to the LONWORKS® network by the Open Loop Sensor Object. This object is implemented 8 times in the UK24LON unit (see next page).

nvoSensorValue **SNVT_xxx**
This output variable shows the actual sensor value. Depending on the type of sensor connected, the output variable can be configured via the Plug-in of the UK24LON unit.

Der SNVT_xxx can be configured as follows:

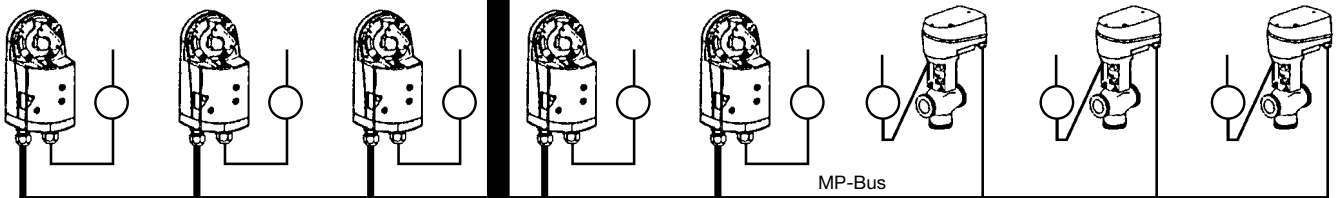
SNVT_temp_p	SNVT_lev_percent	SNVT_lux
SNVT_temp	SNVT_abs_humidity	SNVT_press_p
SNVT_switch	SNVT_enthalpy	SNVT_smo_obscur
SNVT_flow	SNVT_ppm	SNVT_power
SNVT_flow_p	SNVT_rpm	SNVT_elec_kwh

Functional Profile for 8 MFT2 damper actuators and 8 sensors implemented in a UK24LON unit

UK24LON



MP-BUS



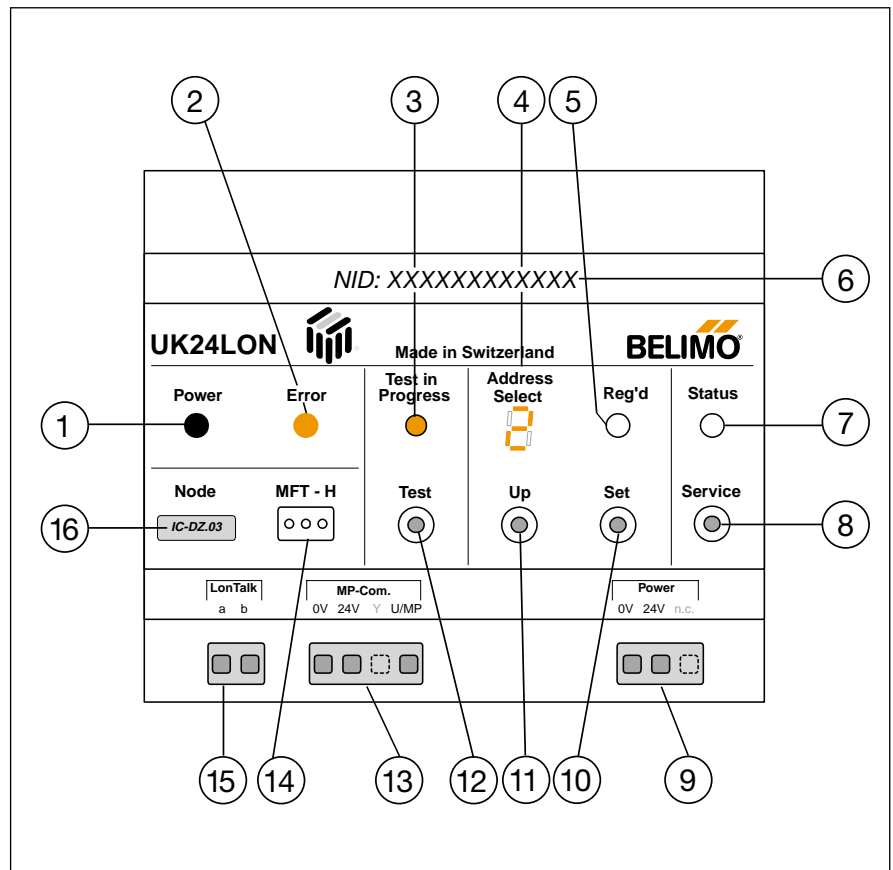
Legend for operating controls

- ① Power LED
- ② Error LED
- ③ Test in progress LED
- ④ MP address display
- ⑤ Registered actuator LED
- ⑥ Individual Neuron ID
- ⑦ Status LED function according to Echelon Guidelines
- ⑧ Service button for commissioning with LONWORKS®
- ⑨ Unit power supply AC or DC 24 V SET button for MP addressing
- ⑩ Set button for MP addressing
- ⑪ Up button for MP addresses
- ⑫ Start test button
- ⑬ MP connector: For connecting MFT2 actuators
- ⑭ MFT-H connector: For connecting the MFT-H parameter assignment device or PC-Tool
- ⑮ LONWORKS® connector
- ⑯ Node label

The operating controls numbered

- ② ③ ④ ⑤ ⑦ ⑩ ⑪ ⑫

are described in greater detail on Pages 10 and 11.



Operation, Characteristics of the UK24LON unit

Automatic scanning of the MP network

As soon as the UK24LON unit is powered up it starts scanning the MP network automatically. All eight MP addresses are interrogated cyclically to see whether there is an actuator available to respond. The results are compared against a reference table stored in the UK24LON unit. If an actuator responds from an MP address that is not assigned in the reference table it is automatically inserted into the table. If an actuator already assigned in the reference table fails to respond an error alarm is initiated but the reference table is not altered in any way. The actuators can be pre-addressed so that they are recognized automatically when they are connected to the MP network.

Manual addressing of actuators

- All required actuators must be connected first.
- Use the **Up** button (11) to select the address to be issued. The actual address will be shown on the display (4).
- Use the **Set** button (10) to start the addressing process (hold for at least 2 seconds). The **Reg'd** LED (5) starts flashing slowly (at ½ second intervals) to indicate that the process is in progress.

- Within the next 10 minutes the actuator being addressed must be reset at the actuator itself (in the case of NMV-D2M, AM and GM actuators by pressing the manual disengagement button; in the case of LF and AF actuators by moving the L/R switch back and forth and in the case of NV actuators by pressing the S2 button). The UK24LON unit will then be able to recognize and address the actuator. This status is indicated by fast flashing of the **Reg'd** LED (5).
- As soon as addressing of the actuator has been completed the **Reg'd** LED (5) gives a steady light. This also indicates that the MP address has been successfully stored in the reference table of the UK24LON unit.

Notes on addressing

- If none of the actuators has been reset within 10 minutes of the addressing process being initiated, the process will be discontinued. The reference table remains unchanged and the **Reg'd** LED (5) stops flashing.
- If an address is issued that has already been assigned to another actuator the latter is automatically de-addressed first before the new actuator is addressed.
- If a mistake is made in initiating addressing, the process can be stopped by briefly pressing the **Set** button.

- Normal data traffic on the MP network is interrupted while addressing is in progress.

Manual de-addressing of MFT2 actuators

- All required actuators must be connected first.
- Use the **Up** button (11) to select the address to be deleted. The actual address will be shown on the display (4).
- Use the **Set** button (10) to start the de-addressing process (hold for at least 2 seconds). The **Reg'd** LED (5) starts flashing slowly (at ½ second intervals) to indicate that the process is in progress.
- Press the **Set** button (10) a second time and hold it depressed until the **Reg'd** LED (5) starts fast flashing.
- As soon as de-addressing of the actuator has been completed, i.e. deleted from the reference table, the **Reg'd** LED (5) goes dark.

Notes on de-addressing

- If, after de-addressing has been initiated, the **Set** button (10) is not pressed a second time, the de-addressing process will be discontinued. The reference table remains unchanged and the **Reg'd** LED (5) stops flashing.
- If there is no actuator connected, only the entry in the reference table of the UK24LON unit will be deleted. It will be registered again when the actuator is reconnected.
- If a mistake is made in initiating de-addressing, the process can be stopped by pressing the **Set** button (10).
- Normal data traffic on the MP network is interrupted while de-addressing is in progress.

Testing the MFT2 actuators

- Use the **Up** button (11) to select the address to be tested. The actual address will be shown on the display.
- Now start the test with the **Test** button (12). The **Test in progress** LED (3) gives a steady light to indicate that the process is in progress. The actuator opens fully and then closes fully.
- When the test has been completed the **Test in progress** LED (3) goes out and the actuator returns to its last reference position.

Notes on testing

- If a mistake is made in initiating testing, the process cannot be stopped. Normal data traffic with the other actuators on the MP network is continued while testing is in progress.
- **Note:** By holding the button depressed for more than 2 seconds all addressed and responding actuators can be tested simultaneously.
- No mechanical testing of actuators can be initiated at addresses that have either not been registered or are incorrect.

Automatic standby mode (darkening of the display)

The displays and operating controls of the UK24LON unit are deactivated automatically when they are not being used in order to save energy and to avoid accidental (mal-)operation. Automatic deactivation occurs approximately 2 minutes after the last time an operating control is used provided there is no mechanical testing or addressing in progress and no errors are being displayed. The unit can be reactivated by pressing the **Up** button (11) (for at least 2 s). It will not be possible to perform a mechanical actuator test or addressing/de-addressing until this has been done.

Error displays

The UK24LON unit can detect communications faults on the MP network. They are indicated by the **Error** LED (2) lighting up and the appropriate address being displayed. If more than one address is affected the lowest one will be displayed. The display can then be scrolled with the **Up** button (11). The UK24LON unit cannot change to standby mode as long as an error is being displayed.

LON status display

The **Status** LED (7) behaves as indicated in the Echelon Guidelines:

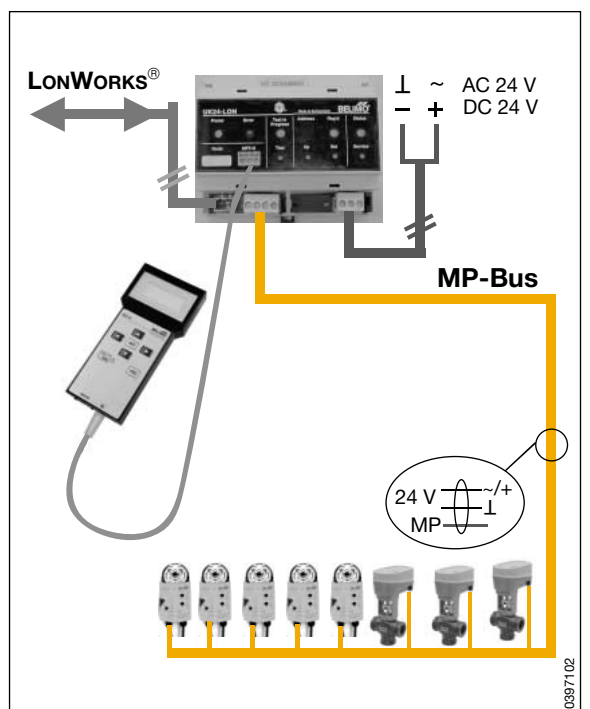
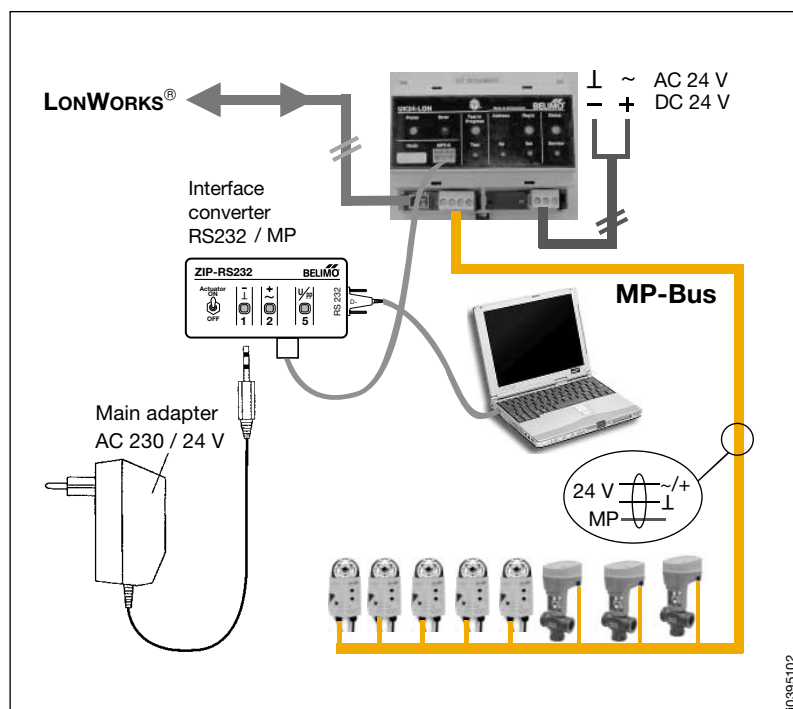
- **Dark:**
The UK24LON unit is ready for service and connected to the LONWORKS® network.
- **Flashing at 2-second intervals:**
The UK24LON unit is ready for service but not connected to the LONWORKS® network.
- **Steady light:**
The UK24LON unit has not been loaded with application software.
- **Other flashing:**
There is a fault in the UK24LON unit.

Connecting parameterizing tools for the MFT2 actuators

Using the Belimo PC-Tool or the MFT-H manual parameter assignment device it is very easy to preset specific parameters (e.g. running time) for individual actuators.

The MFT-H or the PC (PC via ZIP-RS232 interface) can be connected to the 3-pole plug socket of the UK24LON unit to obtain direct access to the appropriate actuator.

During access the UK24LON unit signals that communication between MFT-H or PC-Tool and actuator is in progress by means of a letter H on the display (4).



The worldwide leading actuator technology for all controlled devices in heating, ventilation and air-conditioning plants

Air applications



Damper actuators and spring-return actuators for air control dampers are invaluable elements of good HVAC systems.

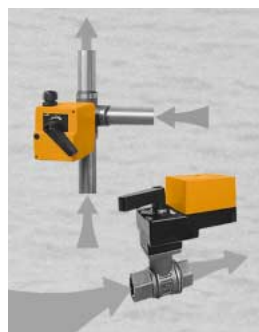


Extra-strong safety actuators for motorizing fire and smoke extraction dampers help raise safety standards in buildings.



Air volume boxes – equipped with VAV-Control – ensure higher standards of comfort for the occupants of air-conditioned single rooms as well as saving energy.

Water applications



Rotary actuators for heating system mixing valves and motorized ball valves ensure reliable control of HVAC water systems.



Globe valves with MFT2 actuators allow easy adaptation to the needs of HVAC systems.

Belimo Headquarters

CH BELIMO Holding AG
Guyer-Zeller-Strasse 6
8620 Wetzikon, Switzerland
Tel. ++41 (0)1 933 11 11
Telefax ++41 (0)1 933 12 68
E-Mail: info@belimo.ch
Internet: http://www.belimo.ch

Belimo Subsidiaries

AT/ BELIMO Automation
Handelsgesellschaft m.b.H.
Geiselbergstrasse 26-32
1110 Wien, Austria
Tel. ++43 (0)1 749 03 61-0
Telefax ++43 (0)1 749 03 61-99
E-Mail: info@belimo.at

CA BELIMO Aircontrols (CAN), Inc.
5716 Coopers Ave., Units 14&15
Mississauga, Ontario L4Z 2E8
Canada
Tel. ++1 (1)905 712 31 18
Telefax ++1 (1)905 712 31 24
E-Mail: webmaster@belimo.com

CH BELIMO Automation AG
Sales Switzerland
Guyer-Zeller-Strasse 6
8620 Wetzikon, Switzerland
Tel. ++41 (0)1 933 12 12
Telefax ++41 (0)1 933 12 66
E-Mail: verkch@belimo.ch
Internet: http://www.belimo.ch

DE BELIMO Stellantriebe
Vertriebs GmbH,
Welfenstr. 27, Postfach 72 02 30
70599 Stuttgart, Germany
Tel. ++49 (0)711 1 67 83-0
Telefax ++49 (0)711 1 67 83-73
E-Mail: info@belimo.de
Internet: http://www.belimo.de

ES BELIMO Ibérica
de Servomotores, S.A.
C/San Romualdo, 12-14
28037 Madrid, Spain
Tel. ++34 91 304 11 11
Telefax ++34 91 327 25 39
E-Mail: info@belimo.es

FR BELIMO Servomoteurs
Z.A. de Courtry
33, Rue de la Régale
77181 Courtry, France
Tél. ++33 (0)1 64 72 83 70
Telefax ++33 (0)1 64 72 94 09
E-Mail: mail@belimo.fr

GB BELIMO Automation UK Limited
The Lion Centre
Hampton Road West
Fulham, Middlesex, Great Britain
TW 13 6DS
Tel. ++44 (0)20 8755 4411
Telefax ++44 (0)20 8755 4042
E-Mail: belimo@belimo.co.uk

HK BELIMO Actuators Ltd.
Room 208, 2/F
New Commerce Centre
19 On Sum Street, Shatin, N.T.
Hong Kong
Tel. ++852 26 87 17 16
Telefax ++852 26 87 17 95
E-Mail: info@belimo.com.hk

SG BELIMO Actuators Pte Ltd
2, Jurong East Street 21
#04-31F IMM Building
Singapore 609601
Tel. ++65 564 9828
Telefax ++65 564 9038
E-Mail: singapore@belimo.com.hk

US BELIMO Aircontrols (USA), Inc.
43 Old Ridgebury Road
P.O. Box 2928
Danbury, CT 06810 USA
Tel. ++1 (1)203 791 99 15
Telefax ++1 (1)203 792 29 67
E-Mail: webmaster@belimo.com
Internet: http://www.belimo.com

Belimo Representatives and Agencies

AE BELIMO Automation
Middle East Office
P.O. Box 55427
Dubai, U.A.E.
Tel. ++971 (0)4 387 417
Telefax ++971 (0)4 387 415
E-Mail: belimome@emirates.net.ae

AU BELIMO Australia Pty. Ltd.
P.O. Box 990,
Braeside VIC 3195, Australia
Tel. ++61 (0)3 9587 8244
Telefax ++61 (0)3 9587 8233
E-Mail: belimo@net2000.com.au

BE BELIMO Automation N.V.-S.A.
Leuvensesteenweg 613
1930 Zaventem, Belgium
Tel. ++32 (0)2 757 92 95
Telefax ++32 (0)2 757 90 36
E-Mail: info@belimo.be

BG BELIMO Bulgaria Ltd.
j.k. Borovo, bl. 223A
entr. B, ap. 25
1680 Sofia, Bulgaria
Tel. ++3592 958 18 04
Telefax ++3592 54 58 95
E-Mail: belimo@itech.bg

CN BELIMO Actuators Ltd.
18 FA3, 585 Longhua West-Road
200232 Shanghai, China
Tel. ++86 21 6469 2895
Telefax ++86 21 6469 2909
E-Mail: shanghai@belimo.com.hk

CN BELIMO Beijing
Rm 605, Beijing Hai Chang
Edifice, 44, Liang Ma Qiao Road
Chao Yang District
100016 Beijing, China
Tel. ++86 10 6462 1382
Telefax ++86 10 6462 1383
E-Mail: beijing@belimo.com.hk

CR BELIMO CZ (Ing. Ivar Mentzl)
Charkovská 16
10100 Praha 10, Czech Republic
Tel. ++420 (0)2 717 40 311
Telefax ++420 (0)2 717 43 057
E-Mail: info@belimo.cz

CY R.E.S. Ltd.
P.O. Box 8297
Nicosia, Cyprus
Tel. ++357 (0)2 51 10 07
Telefax ++357 (0)2 49 65 47
E-Mail: reliance@spidernet.com.cy

DK BELIMO A/S
Thomas Helstedesvej 7
8660 Skanderborg, Denmark
Tel. ++45 86 52 44 00
Telefax ++45 86 52 44 88
E-Mail: info@belimo.dk

EE BELIMO Balticum AS
Tõöstuse 3
10413 Tallinn, Estonia
Tel. ++372 6 414 112
Telefax ++372 6 414 113
E-Mail: kari.manninen@belimo.ee

FI Oy Suomen BELIMO Ab
Insinöörinkatu 2
00810 Helsinki, Finland
Tel. ++358 (0)9 75 11 65 00
Telefax ++358 (0)9 75 11 65 31
E-Mail: belimo@tel.fi

GR BELIMO Air Controls
29, Taorm. Plessa, Kallithea
GR 17874 Athens, Greece
Tel. ++30 (0)1 94 00 766
Telefax ++30 (0)1 94 00 767
E-Mail: belimogr@tee.gr

HR/ SI BELIMO d.o.o.
Puzev breg 1
51211 Matulji, Croatia
Tel. ++385 (0)51 27 20 51
Telefax ++385 (0)51 27 24 81
E-Mail: belimo@ri.tel.hr

IT BELIMO Servomotori S.r.l.
Via Stezzano, 5
24050 Zanica BG, Italy
Tel. ++39 035 67 26 82
Telefax ++39 035 67 02 00
E-Mail: bedema@tin.it

IE Safeguard Systems Ltd.
Systems House, Unit 34
Southern Cross Business Park
Bray, Co Wicklow, Ireland
Tel. ++353 (0)1 2761600
Telefax ++353 (0)1 2761611
E-Mail: safeguard@iol.ie

IL Shemer Representations
P.O. Box 296
56101 Yehud, Israel
Tel. ++972 3 536 51 67
Telefax ++972 3 536 05 81
E-Mail: shem_rep@netvision.net.il

IN BELIMO Vitek Air Controls
C-114 Lancelot, First Floor
S.V. Road, Borivali (West)
Mumbai 400 092, India
Tel. ++91 22 806 21 63
Telefax ++91 22 806 21 63
E-Mail: bvac@bom2.vsnl.net.in

IS Hitatækni ehf.
Langholtsvegi 109
104 Reykjavik, Iceland
Tel. ++354 5 88 60 70
Telefax ++354 5 88 60 71
E-Mail: fridmar@hitataekni.is

LB Energy Center (EC)
Hamra, Leon Street, Shatilla,
Bldg. 4th Floor,
P.O. Box 113-6955
Beirut, Lebanon
Tel. ++961 (0)1 35 38 23
Telefax ++961 (0)1 35 38 23
E-Mail: belimome@emirates.net.ae

MA BELIMO Maghreb
Monica Plage, Villa No. 71
Mohammedia 20650, Morocco
Tel. ++212 2 331 26 59
Telefax ++212 2 331 32 76
E-Mail: belimo.maghreb@wanadoo.net.ma

NO BELIMO Spjeldmotorer A/S
Konowsgate 5
0192 Oslo 1, Norway
Tel. ++47 22 70 71 71
Telefax ++47 22 70 71 70
E-Mail: belimo@online.no

NL BELIMO Servomotoren B.V.
Radeweg 25, 8171 MD Vaassen
Postbus 300, 8160 AH Epe,
Netherlands
Tel. ++31 5 78 57 68 36
Telefax ++31 5 78 57 69 15
E-Mail: info@belimo.nl

NZ Modulair New Zealand Ltd.
P.O. Box 40033
Upper Hutt, New Zealand
Tel. ++64 4 388 48 03
Telefax ++64 4 388 48 03

PH BELIMO Actuators Philippines
Rm.# 507 Anita Build., 5th Floor
1300 Quezon Ave., Cor.South Ave.
1103 Quezon City, Philippines
Tel. ++63 (2) 373 5440
Telefax ++63 (2) 373 5424
E-Mail: philippines@belimo.com.hk

PK Union Dynamics Corporation
B-152 Unit 7-8 Chandni Plaza
Chandni Chowk, Satellite Town,
Rawalpindi, Pakistan
Tel. ++92 (0)51 45 40 39
Telefax ++92 (0)51 42 23 01

PL BELIMO Sp.z o.o.
ul. J. Smulzkowskiego 4a
00-389 Warszawa, Poland
Tel. ++48 (0)22 826 24 32
Telefax ++48 (0)22 826 10 10
E-Mail: sprzedaz@belimo.com.pl

RU BELIMO Servomotors
Russia Ltd.
Nizhnyaya Pervomaiskaya,
46 Bld.1, Office 303
105203 Moscow, Russia
Tel. ++7 095 965 74 64
Telefax ++91 221 221 59 95
E-Mail: belimo.russia@mtu-net.ru

RO Mano Construct srl
Dr Felix 53, ap 14, sector 1
Bucuresti, Romania
Tel. ++401 220 05 78
Telefax ++401 221 59 95
E-Mail: manoconstruct@fb.ro

SE BELIMO Spjällmotorer AB
Hägerstens Allé 88
129 37 Hägersten, Sweden
Tel. ++46 (0)8 88 07 00
Telefax ++46 (0)8 97 85 75
E-Mail: info@belimo.se

SK MARET System
Malinovskyého 34
91501 Nové Mesto n.V., Slovakia
Tel. ++421 (0)834 71 61 66
Telefax ++421 (0)834 71 21 61
E-Mail: maret@internet.sk

SY Philippe A. Jebran
P.O. Box 7791
Damascus, Syria
Tel. ++963 11 231 6586
Telefax ++963 11 231 4052
E-Mail: belimome@emirates.net.ae

TR BELIMO Otomasyon A.S.
Hayriye Caddesi No. 16
TR-80060 Galatasaray-Istanbul
Turkey
Tel. ++90 (0)212 249 76 43
Telefax ++90 (0)212 243 02 58
E-Mail: info@belimo.com.tr

TW Chianseng Enterprise Co. Ltd.
No. 21, Tong Fong Street
Taipei, Taiwan
Tel. ++886 2 27 08 77 80
Telefax ++886 2 27 02 90 90
E-Mail: taiwan@belimo.com.hk

UA IPC Cyclone
34-A, Ul. Yurkovskaya, Appt.N°2
254080 Kiev, Ukraine
Tel./Telefax ++380 44 463 7586

ZA BELIMO Actuators Southern Africa cc
P.O. Box 2483
Alberton 1450, South Africa
Tel. ++27 (0)11 868 5681
Telefax ++27 (0)11 900 2673
E-Mail: belimo@mega.co.za