Product description
• Processor-controlled ballast with xtec inside
• Noise-free precise control via DSI signal, switchDIM, corridorFUNCTION or DALI
• DALI-MEMORY
• Extended DALI commands
• OEM-specific reserved memory areas
• CELMA energy class A1 BAT

Interfaces
• DALI
• DSI
• switchDIM (with memory function + selectable dimming rate)
• corridorFUNCTION (3 preprogrammed profiles + individually programmable)
• Integrated SMART-Interface

Functions
• Intelligent Temperature Guard (protection against thermal damage)
• Intelligent Voltage Guard (overvoltage indication and undervoltage shutdown)
• Optimum filament heating in any dimmer setting
• Disconnection of filament heating from a dimming level of approx. 90 % for maximum energy efficiency (SMART-Heating Concept)
• Fade rates between 50 ms and 90 s (min-max.)
• plugADDRESSING – simple configuration of lighting systems
• corridorFUNCTION with daylight control
• Dimming possible in DC mode
• Automatically triggered emergency lighting value in DC mode, can be set between 1 and 100 %
• For emergency lighting systems as per EN 50172
• Automatic start after replacement of defective lamps
• Backwards compatible

1) according to the EU directives on ecodesign requirements (EC) No. 245/2009 and (EC) No. 347/2010

Standards, page 3
Wiring diagrams and installation examples, page 6

Technical data
Power input on standby < 0.5 W
Protective hot restart 0.5 s for AC / 0.2 s for DC
Dimming range 1 – 100 %
Lamp start possible from 1 %
Operating frequency ~40 – 100 kHz
Life 50,000 h
Height 21 mm

Ordering data
Type Article number
For luminaires with 1 lamp
PCA 1x55 TCL EXCEL one4all lp xtec 22176236
For luminaires with 2 lamps
PCA 2x55 TCL EXCEL one4all lp xtec 22176238
Packaging 360 mm casing: 10 pieces/carton, 760 pieces/pallet
Packaging 425 mm casing: 10 pieces/carton, 640 pieces/pallet
## Digital dimmable ballasts for fluorescent lamps
### EXCEL series

**Specific technical data**

<table>
<thead>
<tr>
<th>Lamp wattage</th>
<th>Lamp type</th>
<th>Type</th>
<th>Length L</th>
<th>Hole spacing D</th>
<th>Weight</th>
<th>Circuit power (W)</th>
<th>Lamp wattage (W)</th>
<th>Current at 230 V / 50 Hz</th>
<th>λ at 50 Hz / 230 V</th>
<th>tc point</th>
<th>Ambient temperature ta</th>
</tr>
</thead>
<tbody>
<tr>
<td>For luminaires with 1 lamp: 1 x 55 W</td>
<td>TC-L</td>
<td>PCA 1x55 TCL EXCEL one4all lp xtec</td>
<td>360 mm</td>
<td>350 mm</td>
<td>0.27 kg</td>
<td>59 W</td>
<td>55 W</td>
<td>0.26 A</td>
<td>0.98</td>
<td>80 °C</td>
<td>-25 ... 60 °C</td>
</tr>
<tr>
<td>For luminaires with 2 lamps: 2 x 55 W</td>
<td>TC-L</td>
<td>PCA 2x55 TCL EXCEL one4all lp xtec</td>
<td>425 mm</td>
<td>415 mm</td>
<td>0.34 kg</td>
<td>118 W</td>
<td>110 W</td>
<td>0.51 A</td>
<td>0.99</td>
<td>80 °C</td>
<td>-25 ... 50 °C</td>
</tr>
</tbody>
</table>

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1. Valid at 100 % dimming level
2. +10 °C to ta max: unrestricted dimming. -25 °C to +10 °C: unrestricted dimming from 100 % to 30 %. -25 °C to +10 °C: dimming below 30 %: malfunction possible but no damage to ECG. This applies to AC and DC operation.
Standards
EN 55015
EN 55022
EN 60929
EN 61000-3-2
EN 61347-2-3
EN 61547
Suitable for emergency installations according to EN 50172

Lamp starting characteristics
Warm start
Starting time 0.5 s with AC
Starting time 0.2 s with DC
Start at any dimming level

AC operation
Mains voltage
220–240 V 50/60 Hz
198–264 V 50/60 Hz including safety
tolerance (+10%)
202–254 V 50/60 Hz including performance
tolerance (+6% / -8%)

DC operation
220–240 V 0 Hz
198–280 V 0 Hz certain lamp start
176–280 V 0 Hz operating range
Use in emergency lighting installations according to EN 50172 or for emergency luminaires according to EN 61347-2-3 appendix J.

Light output level in DC operation
Programmable from 0 % to 100 %
Programming by extended DSI or DALI signal (16 bit).
Default value is 70 %
In DC operation dimming mode can be activated.

Emergency units
The “PCA TCL EXCEL one4all lp xtsec” ballasts are compatible with all emergency units from Tridonic.
See the table in the data sheet. Also all “5-pole” emergency units can be used. When used with other emergency units tests are necessary.

Temperature range
Unlimited dimming range from 10 °C to t max.
-25 °C to +10 °C: dimming operation from 100 % to 30 %. If dimm level goes below 30 % malfunction possible, but no electronic ballast damage.
This applies to AC and DC operation.

Mains currents in DC operation (at 70 % light output)

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>Un = 220 VDC</th>
<th>Mains current at Un = 220 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1x55 TCL EXCEL one4all lp xtsec</td>
<td>1x55 W</td>
<td>0.21 A</td>
<td>0.19 A</td>
</tr>
<tr>
<td>PCA 2x55 TCL EXCEL one4all lp xtsec</td>
<td>2x55 W</td>
<td>0.42 A</td>
<td>0.38 A</td>
</tr>
</tbody>
</table>

Ballast lumen factor AC operation (AC-BLF) EN 60929 8.1

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>AC-BLF at U = 230 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1x55 TCL EXCEL one4all lp xtsec</td>
<td>1x55 W</td>
<td>0.98</td>
</tr>
<tr>
<td>PCA 2x55 TCL EXCEL one4all lp xtsec</td>
<td>2x55 W</td>
<td>0.98</td>
</tr>
</tbody>
</table>

The ballast lumen factor for AC operation (AC-BLF) does not alter from Un = 198 V AC to Un = 254 V AC.
The ballast lumen factor for DC operation (DC-BLF) on the basis of an automatic power reduction of the ballasts (default value is 70 %) will be smaller than AC. It does not alter in the DC operating range (198–280 V DC).

Harmonic distortion in the mains supply (at 230 V / 50 Hz)

<table>
<thead>
<tr>
<th>Type</th>
<th>Wattage</th>
<th>THD</th>
<th>3</th>
<th>5</th>
<th>7</th>
<th>9</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA 1x55 TCL EXCEL one4all lp xtsec</td>
<td>1x55 W</td>
<td>7.1</td>
<td>5.7</td>
<td>1.0</td>
<td>1.3</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>PCA 2x55 TCL EXCEL one4all lp xtsec</td>
<td>2x55 W</td>
<td>4.1</td>
<td>2.1</td>
<td>0.6</td>
<td>0.9</td>
<td>1.0</td>
<td>0.8</td>
</tr>
</tbody>
</table>

The ballast lumen factor for AC operation (AC-BLF) does not alter from Un = 198 V AC to Un = 254 V AC.
The ballast lumen factor for DC operation (DC-BLF) on the basis of an automatic power reduction of the ballasts (default value is 70 %) will be smaller than AC. It does not alter in the DC operating range (198–280 V DC).
Digital dimmable ballasts for fluorescent lamps
EXCEL series

Dimming
Dimming curve is adapted to the eye sensitiveness.
Dimming range 1% to 100%
Digital control with:
- DSI signal: 8 bit Manchester Code
  Speed 1 % to 100 % in 1.4 s
- DALI signal: 16 bit Manchester Code
  Maximum speed 1 % to 100 % in 550 ms
  (adjustable between 50 ms and 90 s)
Programmable parameter:
  Minimum dimming level
  Maximum dimming level
  Default minimum = 1 %
  Default maximum = 100 %

Control input (DA/D1, DA/D2)
Digital DALI/DSI signal or a push-to-make switch
(switchDIM) can be wired on the same terminals
(DA and DA).

Digital signal DALI/DSI
The control input is non-polar and protected against
accidental connection with a mains voltage up to
264 V. The control signal is not SELV. Control cable has
to be installed in accordance to the requirements of
low voltage installations.
Different functions depending on each module.

SMART interface
An additional interface for the direct connection of the
SMART-LS II lp\(^0\) light sensor. The sensor registers
actual ambient light and maintains the individually
defined lux level.
After every mains reset the SMART interface auto-
matically checks for an installed sensor. With the
sensor installed the PCA TCL EXCEL one4all lp\(\times tec\)
automatically runs in the constant lux level mode.
ON/OFF switch via mains, switchDIM or DALI/DSI
signal.
DALI/DSI signal = 0 switches off,
DALI/DSI signal ≥ 1 switches on.
With relative DALI dimming commands (e.g. up, down
etc.) or switchDIM signals it is possible to change the
controlled light level temporarily.
Temporarily means that after a switching cycle OFF/
ON command the ballast will start at the preset value
determined by the SMART-LS II lp. The installation of
the two wire bus is according to the appropriate low
voltage regulations.

switchDIM
Integrated switchDIM function allows a direct
connection of a push to make switch for dimming and
switching.

\(^0\) SMART-LS II lp: article number 86458258

Brief push (< 0.6 s) switches ballast ON and OFF. The
ballasts switch-ON at light level set at switch-OFF.
When the push to make switch is held, PCA ballasts
are dimmed. After repush the PCA is dimmed in the
opposite direction.
The switchDIM fade time is set to 3 s from min. to
max. in the factory settings. With a 20 s push to the
push to make switch this fade time can be changed
to 6 s. In this instance the switchDIM application will
be synchronized to 50 % light level after 10 s and after
20 s the light level rises to 100 % with the fade
time.

At every synchronization (10 s key stroke) the device
will reset to 3 s (factory setting)
In installations with PCAs with different dimming levels
or opposite dimming directions (e.g. after a system
extension), all PCAs can be synchronized to 50 %
light level by a 10 s push.
Use of push to make switch with indicator lamp is not
permitted.

switchDIM and corridorFUNCTION are very simple tools
for controlling ballasts with conventional momentary-
action switches or motion sensors.
To ensure correct operation a sinusoidal mains voltage
with a frequency of 50 Hz or 60 Hz is required at the
control input.
Special attention must be paid to achieving clear zero
crossings.
Serious mains faults may impair the operation of
switchDIM and corridorFUNCTION.

Backwards compatibility
With a simple key combination a PCA TCL EXCEL
one4all lp\(\times tec\) can be reset as a normal PCA EXCEL
lp from the previous generation. Synchronisation
simply has to take place three times within one
minute (3 x 10 s).
To activate the \(\times tec\) settings again, synchronisation
has to take place four times within one minute.

Energy saving
PCA TCL EXCEL one4all lp\(\times tec\)

Digital dimming value

Dimming characteristics
PCA TCL EXCEL one4all lp\(\times tec\)

Energy saving
PCA TCL EXCEL one4all lp\(\times tec\)

Continuous operation: to calculate the protective safety switch see main current, page 2

Data sheet 10/11-879-2
Subject to change without notice.
www.tridonic.com
Intelligent Voltage Guard
Intelligent Voltage Guard is the name of the new electronic monitor from Tridonic. This innovative feature of the PCA family of control gear from Tridonic immediately shows if the mains voltage rises above certain thresholds. Measures can then be taken quickly to prevent damage to the control gear.

- If the mains voltage rises above approx. 305 V (voltage depends on the ballast type), the lamp starts flashing on and off.
- This signal “demands” disconnection of the power supply to the lighting system.

Intelligent Temperature Guard
The intelligent temperature guard protects the PCA TCL EXCEL one4all lp x tec from thermal overheating by reducing the output power or switching off in case of operation above the thermal limits of the luminaire or ballast. Depending on the luminaire design, the ITG operates at about 5 to 10 °C above Tc temperature.

Intelligent Temperature Guard
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plugADDRESSING – simple handling, commissioning and wiring
The new plug&play solution simplifies handling. By attaching different colored marked plugs to the SMART Interface, group addresses are assigned to the PCA TCL EXCEL one4all lp x tec. This supersedes a single addressing and the devices can be put into operation without any additional programming. Another significant advantage of this concept is in case of exchange and no limits to 64 DALI addresses. Ideal for RGB applications and cost-effective system solutions with simple controllers. Simple – Quick – Plug&Play!

## Data sheet 10/11-879-2
Subject to change without notice.

www.tridonic.com
Digital dimmable ballasts for fluorescent lamps
EXCEL series

RFI
- Connection to the lamps of the hot leads must be kept as short as possible
- Mains leads should be kept apart from lamp leads (ideally 5–10 cm distance)
- Do not run mains leads adjacent to the electronic ballast
- Twist the lamp leads
- Keep the distance of lamp leads from the metal work as large as possible
- Mains wiring to be twisted when through wiring
- Keep mains leads inside the luminaire as short as possible

General advise
Electronic ballasts are virtually noise free. Magnetic fields generated during the ignition cycle can cause some background noise but only for a few milliseconds.

Operation on DC voltage
Our ballasts are construed to operate DC voltage and pulsed DC voltage.
To operate ballasts with pulsed DC voltage the polarity is absolute mandatory.

Programming
With appropriate software and a USB interface different functions can be activated and various parameters can be configured in the new PCA TCL EXCEL one4all lp xtec. All that is needed is a DALI-USB and the software.

configTOOL
Full version for programming all the functions and parameters.

pc CONFIGURATOR
For programming the corridorFUNCTION, device configuration (fade time, ePowerOnLevel, etc.) DC level, compatibility settings, and startup date and for resetting.
Maximum amount of ballast see DALI/DSI specification.

Isolation and electric strength testing of luminaires
Electronic devices can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to IEC 60598-1 Annex Q (informative only) or ENEC 303-Annex A, each luminaire should be submitted to an isolation test with 500 Vcc for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal.
The isolation resistance must be at least 2 MΩ.

As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1500 Vcc (or 1.414 x 1500 Vcc). To avoid damage to the electronic devices this test must not be conducted.

For further technical information please visit www.tridonic.com