DARC TECHNOLOGIES

DARC*BUS*

The new standard in remote controlled LED Lighting

Table of Contents

Introducing DARC*bus*

DARC Technologies has developed a new standard in controlling LED lighting in Homes, Factories, and Commercial buildings. **DARC*bus*** is a means of remotely switching and dimming LED lighting, from either physical switches, sensors, or remotely via the portal device. A simple push button switch allows any light in the building to be switched on or off, or dimmed from zero to full brightness within seconds.

Any number of lights can be controlled from one push button switch, or extra switches on a plate can be used to set pre-set lighting or mood levels. The newly released 1000 series switches come in 1 or 3 button versions, and are standard clear polycarbonate PDL600 series styling, using the standard PDL600 cover plates in white, black or brushed stainless steel. Button colours are also white, black or brushed stainless steel. 2, 4, 5, or 6 button switch plates are available by special order.

The brains of the solution lie in the custom LED driver, which is capable of controlling up to 40W of LED's, either as a driver per light, or up to 3 lights per driver, with the driver receiving control information from any programmed switch in the building.

DARC*bus* uses a new form of mains carrier technology, encoding 9600 baud communications within the mains power connections to switches and lights. This solution can be retrofitted to existing buildings without the need for any additional wiring. Movement or occupancy sensors are either fitted to the ceiling, and wired to the ballast/driver, or can be fitted into the middle position of the 3 way wall switch plate. The system is smart enough to know that it is dark when movement is detected, and to set the lights to a much lower brightness allowing users to see clearly, without being overpowered by full intensity lighting.

Features

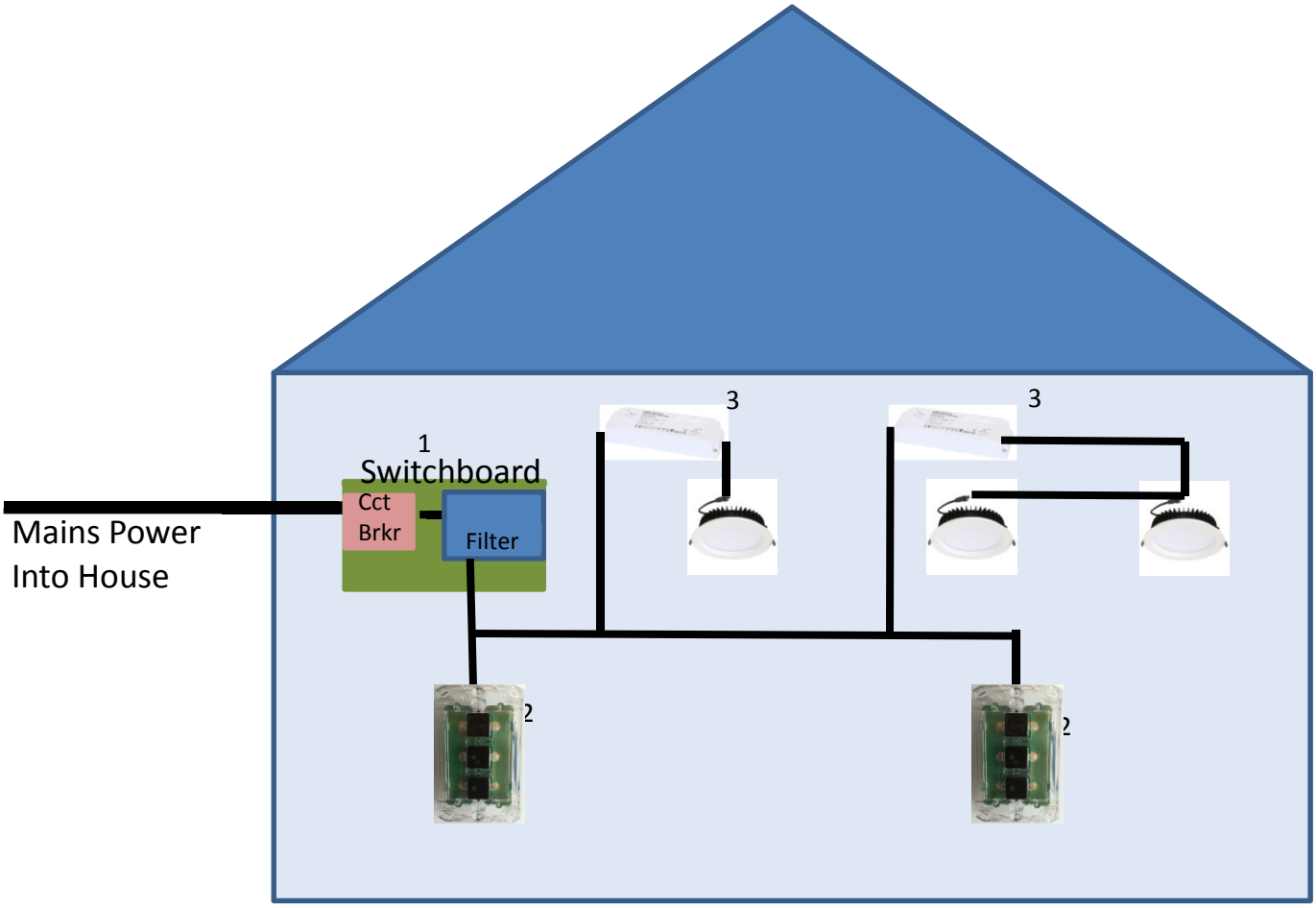
- Switch: 1 or 3 buttons
  - 2,4,5 or 6 button by special order
- Switch has LED backlights, and operation indicators
- Movement Sensor option in middle button position
- Single Press ON/OFF
- Press and HOLD to dim up and down
- Preset "mood" or scene lighting options
- DARC 40W LED Driver has a constant power output to drive a 10-40W LED fitting or strings of fittings
  20W Constant power driver also available.
- The unit can be assigned to a group and its output can be dimmed over the **DARC*bus*** network**.**
- The unit measures the supply voltage, device temperature and calculates the current drawn and keeps a count of run hours and Watt-hours (WH). This information can be retrieved at any time over the **DARC*bus*** network.

Benefits

DARC*bus* offers many advantages over other types of controlled lighting systems.

1) It doesn't require additional wiring to engage the control elements of the system. All communication is over existing power wiring
2) The system can be retrofitted to existing installations – just replace a switch and a ballast/driver.
3) The system can be installed piecemeal – you don't need to retrofit an entire installation at once. **DARC*bus*** works in with existing standard lighting systems and can be fitted out room by room or even light by light.
4) **DARC*bus*** can even interface into existing C-BUS or DALI systems using the unique protocol convertor.
5) The lighting system can be kept separate from other parts of the mains wiring for a building by placing the 20A filter at the switchboard in the lighting circuit only, or the larger 60A filter can be used on the incoming mains to the building, and hence, the mains switched sockets can also be part of the **DARC*bus*** system, such that additional plug-in switches can be used. There is some potential downside to this, as some electronic device power supplies can generate noise on the mains which can affect performance on a **DARC*bus*** system. Filtering is available to assist with this where necessary.
6) The **DARC*bus*** system can be remote controlled by the addition of a home portal device, which extends control over wifi or an Ethernet connection to the internet so that a building may be monitored or controlled off site.
7) Many other advanced feature are also available ;
    a. Light flash – the **DARC*bus*** system in a main living room can be connected to the doorbell, and can be programmed to flash the room lights to warn a hearing impaired person about a visitor at the door.
    b. Due to the thin profile of the switch - only 13mm – the switch can be used in a slimline flush box in places which wouldn't accommodate 'normal' wall switches and wiring. For example, in a wall containing a sliding cavity door. The switch only requires 2 thin 1mm mains lighting connected wires, which can be clipped or glued to the back of the gib keeping them away from the sliding door, and the 3 mm of exposed switch backing cover won't get close to most sliding cavity doors, hence making this fitment possible.
    c. Remote control of lighting in a building also becomes possible. With the home portal connected to the lighting circuit, and to the building wifi or internet, a remote app on a cellphone can access the system and control lighting. This feature also provides a handy wireless remote to use while at home.

How DARC*bus* Works



In a normal house, power comes into the switchboard, and then passes through a number of circuit breakers and then goes to many light switches, and then on to the lights. A **DARC*bus*** house can also be wired this way, with the addition of a DIN Rail mounted filter unit (1) in the switchboard, which ensures that the signalling from this house isn't passed to another **DARC*bus*** controlled house next door. While the wiring can be the same, savings can be made by reducing the amount of wiring required – particularly in a new building. In a **DARC*bus*** wired house, power is only needed to connect to each device – i.e. each light switch (2), and to each driver (3). This should be done using the usual TPS mains cabling. The LED lights still need to connect to the matched driver, but that doesn't have to be done using TPS. Any appropriate DC power cable will do. Gone are the loops of heavy wiring and many connections for 2 or 3 way switching, or looping from switch to switch.

DARC*bus* allows control of any light via its driver from any switch in the house. During the install process, each light switch is 'mapped' to a corresponding driver. Or many switches can be mapped to a driver, or many drivers can be mapped to one or many switches. And it can all be changed at any time. Any switch can turn a light on or off, or can dim a light from 1% to 100%.

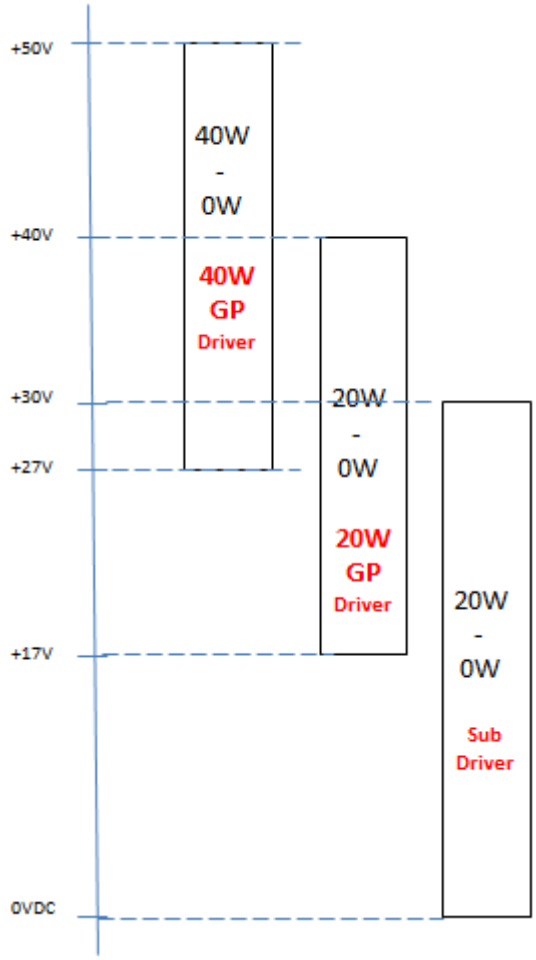
Wiring for the lighting circuits can be kept separate from all other mains wiring by placing the filter (1) just on the lighting circuit at the switchboard and after the cct breaker. Or a larger filter can be used, which keeps **DARC*bus*** signalling within the building, and this also means that switched outlets can be part of the system.

Parts Required

The essence of the system is the GP driver/ballast. Several versions exist: a single 20W driver for an LED light of 0-20W, and a 40W driver which can work with an LED light up to 40W or 2 series connected LED lights of up to 20W each.

The 40W driver can also output to a series of sub drivers allowing individual LED lights of up to 20W to be controlled. The sub drivers are also designed to be small enough to fit into awkward places. Two versions exist – one in a 25mm tubular plastic container, and the other in a more usual small LED Ballast Box.

The choice of Driver depends mostly on the voltage of the LED light. See the following diagram which shows the ranges.



Other driver options include ; Standard **DARC*bus*** Controlled Trailing Edge Dimmer for dimming incandescent lights via **DARC*bus***, and two channel relay output for switching on and off other types of non-dimmable lights or high current appliances.

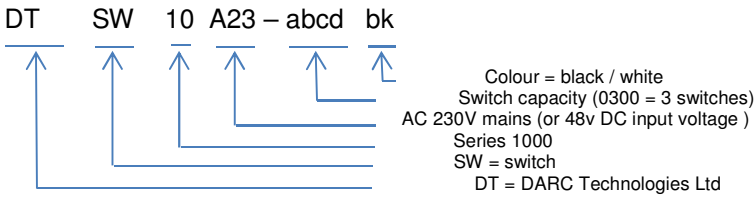
1)	Filter	DTFL10A23--002000	DARC Filter 20A 230V AC
2)	Switch	DTSW10A23--0100WH	DARC Single Switch White
3)	GP Driver	DTDR10A23--002000	DARC GP 20 W Driver
4)	GP Driver	DTDR10A23--004000	DARC GP 40 W Driver
5)	Sub Driver	DTSD10A23--022000	DARC Sub Driver 20W 25mm pipe version
6)	Trailing Edge Dimmer	DTDM10A23--000000	DARC Dimmer unit for incandescent lights
7)	Relay driver	DTRD10A23--000000	DARC dual relay output unit

Product Information

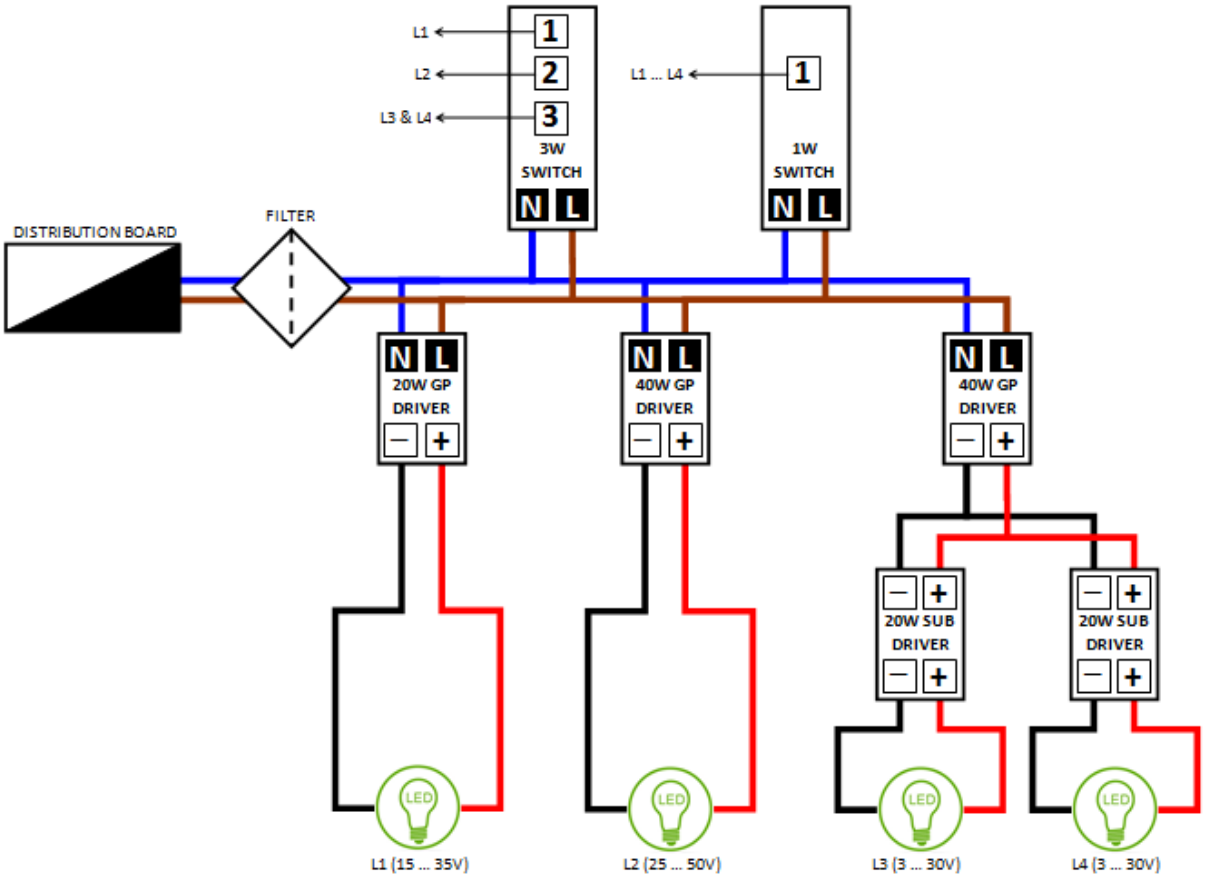
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Vendor		**Type**		**Series**		**Power Supply**			**Unused**		**Type Specific Info**				**Colour**	
DT = DARC Technologies		SW	Switch	10 = 1000		230V AC		A23	Double hyphen '--'		Capacity (if type = SW)				WH	White
		SN	Sensor			3 Phase		A41			1st Digit = unused				BK	Black
		FL	Filter			48V DC		D48			2nd digit = num plate holes				CH	Chrome
		SD	Sub Driver			24V DC		D24			1 = single... 6 = 6 way				00	No Colour
		DM	Dimmer								3rd digit = sensor type					
		RD	Relay O/P								0 = not fitted, P = PIR					
		DR	GP Driver								4th digit = LED colour					
		PT	Portal								e.g. R = Red, G = Green					
		HP	Hi Pwr Drvr								e.g. 031B = 3 way switch with sensor, blue LED					
		MD	Multi Ch Drvr								Rating (DR, SD, DM, RD, HP)					
												20W	0020	100W	0100	
												40W	0040	200W	0200	
											Rating (if type = FL)					
												20A			0020	
												60A			0060	
											Multichannel Info (MD)					
											2nd Digit = num outputs					
											3rd digit = current rating (in A)					
											4th digit = bidirectional status					
											0 = not enabled 1 = bidirectional					
											"0000" (if type = PT or SN)					
											Sub Driver type - SD					
											01xx	Std Type	02xx	25mm pipe		

Examples:		
DARC 6-way AC Switch in Black	DTSW10A23--	060GBK
DARC Single AC Switch in White	DTSW10A23--	010GWH
DARC 40W AC GP Driver	DTDR10A23--	004000
DARC 15W Sub Driver AC	DTSD10A23--	001500
DARC 150W Trailing Edge Dimmer	DTDM10A23--	020000
DARC Sensor @middle of triple switch - white, green LED	DTSW10A23--	03PGWH

Model details



Wiring



The switches are supplied with 2 connections ; Phase (red) and Neutral (black) and are wired to a quick connect block. Wiring into this block can be 1.0mm, 1.5mm or 2.5mm TPS cable. An earth is not required.

GP Drivers have 2 terminal blocks mounted under the removable cover. Again, wiring into these blocks can be 1.0mm, 1.5mm or 2.5mm TPS cable. An earth is not required. The output will come with a pre-fitted quick connect cable termination to allow the matching LED light to plug in. An optional series extender cable is available to allow for 2 series wired LED lights. Alternatively, any appropriate sized DC cable can be used on the output from the GP Driver to connect to LED lights.

Description

In a normal house, power comes into the switchboard, and then passes through a number of circuit breakers and then goes to many light switches, and then on to the lights. A **DARC*bus*** house can also be wired this way, with the addition of a DIN Rail mounted filter unit in the switchboard, which ensures that the signalling from this house isn't passed to another **DARC*bus*** controlled house next door. While the wiring can be the same, savings can be made by reducing the amount of wiring required. In a **DARC*bus*** wired house, power is only needed to connect to each device – i.e. each light switch, and to each driver. The lights still need to connect to the matched driver, but that can be local wiring. Gone are the loops of wiring and many connections for 2 or 3 way switching.

DARC*bus* allows control of any light via its driver from any switch in the house. During the install process, each light switch is 'mapped' to a corresponding driver. Or many switches can be mapped to a driver, or many drivers can be mapped to one or many switches. And it can all be changed at any time. Any switch can turn a light on or off, or can dim it from full brightness to zero.

There are many programmable parameters available within the **DARC*bus*** programming. Switches are the transmitting element, sending signalling out to the system on the mains cabling, and the drivers connected to the same wiring decode the signalling and undertake the commands received. Some commands are very straight forward – e.g. ON/OFF, but when it comes to dimming lights, there are several options available; The light switch may send a ramp signal to the driver, and provide the end point for that ramp, along with the rate of ramp, or the light switch may send information to tell the driver to ramp on its own - to preset characteristics.

Additional inputs (other than switches) are also possible – for example, a PIR sensor as an option in the switch plate. This can be programmed to turn the lights on when movement is detected. The system can also measure the amount of ambient light, and only turn the lights on to a preset level. For example, during daylight, the ambient light sensor knows what the light levels are and when movement is detected, turns the (hallway) lights on full. At night, (say after 11pm), the movement detector only turns the (hallway) lights on to 20% so as to provide sufficient illumination, but not overwhelming light levels given that it is dark !

The light can also be programmed to slowly dim after a period of time with no movement, so that someone still present can move to keep the lights on, without being caught in complete darkness.

The light/movement sensor can also be a ceiling mounted one, in which case it would wire into an aux input on any GP Driver to simplify house wiring, and to maximise opportunity to retrofit such systems easily.

Extra buttons can be programmed to set mood light levels on different lights around a room=- e.g. for watching movies or when dining.

Where house lighting demands the use of either existing incandescent or non-dimmable light fittings, additional Drivers are available to allow control of such luminaires. The Trailing Edge Dimmer module can receive **DARC*bus*** commands and can vary its output AC voltage to suit the dimming of an incandescent light. Similarly, the dual relay output driver can simply switch an output on and off. In this way, these devices allow a full retrofit of **DARC*bus*** into a building. The relay output unit has two outputs which can be switched. Total current rating is 10A, which can be 10A via one relay, or 2 x 5A switched circuits.

Programming

Before **DARC*bus*** can be used, each component needs to be configured/programmed.

There are a number of ways in which this can happen.

All devices as delivered new have a QR code printed onto the device (switch or GP driver etc). This QR code contains information about what that device is, and also its unique serial number.

A common way to programme devices is to set up a local area network within the building, using the programming portal (an installers version of the home portal) which plugs into the mains wiring on the circuit to which the lighting is connected, and then this portal communicates to a cellphone or tablet device with a camera, running a web browser. The browser gives access to the device programming environment. Within the browser, the software allows each device to be QR scanned – and the system learns all about that device, and then devices can be easily connected together within the programme. This programming applies a group number and sets common programming parameters such that switches are set to 'talk to' GP drivers and hence lights. Room by room, the installer scans and joins all switches and GP Drivers etc, until all circuits work as expected. Power must be available for the Installers Portal, and each device needs power so that information sent over the power lines can be programmed, and a local wifi connection is used to connect the portal to the programming cellphone (with camera). For this reason, the installer needs to work in with the electrician to ensure that power is available safely to all devices in the network, at the right time in the development of the electrical systems to (for example) a new house being built.

For detailed programming – see the next chapter.

Another method for programming (particularly a new building being installed for the first time) is for the programming set up utility to be used. In this, a complete building design is 'built', joining all switches to GP drivers across the building in a table within the programme. This table is then passed to the installers' programming portal on site, and this speeds up installation, although needs more planning and forethought in the design phase.

There are many programmable parameters to provide a wide range of flexibility for controlling LED lighting in a building.

Every connectable device in the DARCBUS system has a unique address. EG;

SWITCH = 20-xyz, GP DRIVER = 64-xyz, Dimmer = 60-xyz, Relay = 30-xyz

where xyz is a unique number for each device in the house. Note: the xyz number can be repeated in a switch if used with a driver.

Inside each device, a series of group addresses may be used – and all devices within a group communicate together within that group. Some devices allow multiple groups – so that different devices can do different functions.

When programming the GP Drivers – the driver is a constant power output device. Care needs to be taken to match the GP Driver to the LED lights being connected. When a single LED light is used, please use the 20W driver, and set the power output level to match the light. E.g. a 12W luminaire would have a setting of 12W; a power setting in the driver of 200 is 20W, so 12/20 = 0.6 - which is 60% of 200 → a setting of 120. In the case of two 12W LED lights being driven – then 24W (2 x 12W in series) is more than the 20W GP Driver can manage, so the 40W GP Driver is

selected. A setting of (12+12)/50 x 200 = 96 would be used. A single 12W LED light wouldn't be used on its own with the 40W driver, as the low voltage at minimum dimming level output from the GP Driver is too low. Care must also be taken not to programme the GP Driver to exceed the power rating of the connected LED light. The GP Driver is programmed at the factory to match the LED light being supplied. If the driver is changed at any time, then care must be taken never to use a smaller power light on that driver without first downgrading the power output level in the GP Driver. NOTE : It is recommended that the output of the driver is left open circuit when programming.

Commands can be….

Command	Value	Mandatory	Data bytes	Notes
OFF	1(01)	M	0	Turns output off regardless
ON	2(02)	M	0	Turns output on to default level – set within the GP Driver
TOGGLE	3(03)	R	0	Output toggles its state
CHANGE	6(06)	R	0	If output is ON (1-200), will decrease by amount programmed in GP Driver (Change-by Value) If output if OFF (0), will increase by amount programmed in GP Driver (Change-by Value)
DOWN	7(07)	R	0	If output is ON (1-200), will decrease by amount programmed in GP Driver (Change-by Value)
UP	8(08)	R	0	Will increase by amount programmed in GP Driver (Change-by Value)
MIN	9(9)	R	0	Will go to minimum level programmed in GP Driver
DOWN BY	10(0A)	R	1-50	If output is ON (1-200), will decrease by amount in Data Byte (50 is 4 steps from max 200 to 0, Default 4 is 2% steps, and 1 is 0.5% steps
UP BY	11(0B)	R	1-50	Will increase by amount in Data Byte (50 is 4 steps from max 200 to 0, Default 4 is 2% steps, and 1 is 0.5% steps
CHANGE BY	12(0C)	R	1-50	If output is ON (1-200), will decrease by amount in Data Byte (50 is 4 steps from max 200 to 0, Default 4 is 2% steps, and 1 is 0.5% steps If output if OFF (0), will increase by amount in Data Byte (50 is 4 steps from max 200 to 0, Default 4 is 2% steps, and 1 is 0.5% steps
RAMP	30(1E)	R	Level (0-200) At rate (1-15)	Change from the current output level to a set level (200 = fully on), at a rate (0-15) where 0 = instant, and 3 is 2 seconds, and 10 is 30 seconds
RAMP MIN	31(1F)	O		Same as RAMP above, but with the limit set as the minimum level as programmed in the GP Driver

M = Mandatory – supported by all devices, R = Recommended, O = Optional.

1. For Commands the address is the destination, i.e. where the command is going *to*.
2. Control values are 0-200 to give a control resolution of 0.5%.
3. Rate values are 0-15.

FADE TABLE

Byte value	Time to fade from full to off (s)
0	Instantaneous
1	<1
2	1
3	2
4	4
5	6
6	8
7	10
8	15
9	20
10	30
11	45
12	60(1m)
13	120(2m)
14	300(5m)
15	600(10m)

DARC*BUS* Installer Portal
User Manual

I. Introduction

The **DARC*bus*** 'Installer Portal' allows DARC drivers and switches to be configured during an initial installation or as a retro-fit. It can generate configuration files for an end-user's 'Home Portal' if required.
The system is designed for use on a smartphone or tablet with a camera. The basic setup involves the QR codes of two devices being scanned which will then 'pair' the devices via **DARC*bus*.**

II. Requirements

A smartphone or tablet with an outwards facing camera, WiFi and support for the Google Chrome browser app. Having a charger for your device on-site may be convenient for larger installations.

III. Before This Setup

It is recommended your smartphone has the latest, up-to-date version of the Google Chrome web-browser app. If you don't have Chrome, it can be downloaded from the store appropriate to your smartphone. Use the store's search function to find 'Google Chrome' or 'Chrome Browser'. Download the appropriate entry which should have a manufacturer of Google inc.
Other browser apps such as Firefox, Safari or Opera may work but are not guaranteed.

Ensure all devices to configure are wired in to 230V mains with their QR codes easily accessible for scanning. QR codes are located on:

1. the back of the device itself
   and
2. on the bill of materials next to each device where this has been pre-prepared.

Ensure the power bus is live for configurations to be set.
You are now ready to set up the installer portal itself and begin configuration.

IV. Physical Installation

1. Plug the box into 230V mains or wire directly to switchboard temporarily. Ensure an electrician performs this step.
2. The Portal will automatically power up and begin serving its web-app within 45 seconds

It is recommended you set-up the Installer Portal as close as possible (electrically) to the main switchboard to enhance ability to communicate with all devices. In very large installations it may need to be moved to different locations in order to communicate with some devices. The database will remember any settings if the power is cycled on the Portal.

V. Accessing via WiFi

On your smartphone, connect to the WiFi network with the name/ssid of 'DARC Setup' and password 'darcTechnologies'. This may occur automatically if you have performed a configuration before. Open the Google Chrome app and enter the IP address of 'https://192.168.4.1' in the address bar. A security warning may appear indicating a self-signed site certificate. This warning can be safely ignored: in Chrome select 'Advanced' → 'Continue to Site (unsafe)'. If the Installer Portal is correctly configured, you should see a welcome screen with basic instructions on how to pair devices.

VI. Using the web-app

If you have already configured an installation for a different site and are trying to create a new, blank configuration, you will need to select the 'New House' button and confirm that you want to reset the database. After this or to continue with the current site: just select 'Begin Scanning'. This will open a page with a window for scanning QR codes.

If you have not used the Installer Portal with your smartphone/tablet before, you will need to set the default camera. This can be done any time by selecting the appropriate camera in the drop-down menu, about midway down the page.

Once the default camera is set, the grey viewfinder at the top of the page should liven to show the camera view. You can use this screen to guide scanning QR codes for each device. For optimal scanning, the QR code should be in the centre of the viewfinder with the phone at a distance of about 80mm from the code. The viewfinder should focus automatically. Focusing can sometimes be improved by moving the camera well away for 1 or 2 seconds and then back over the desired code. If any problems persist, the page can be safely refreshed.

The configuration system is broken into 3 main functions:

1. Pairing a switch and a driver
2. Copying the configuration from one switch to another switch
3. Copying the configuration from one driver to another driver

For pairing a switch and driver (1), the QR codes of each device can be scanned in any order. For copying switch configurations (2), the first device scanned will be unchanged and the second will inherit the new settings selected from the first. For copying drivers (3), any unassigned groups on the first driver will be assigned from the pool of addresses. All settings will then be copied to the second driver up to the maximum possible (the number of outputs on the driver with the least outputs). This allows devices which act as both switches and drivers, such as the Mains Adaptor, to be considered a driver.

These uses are covered in more depth below.

Once a QR code is successfully scanned, an info screen will pop up outlining the device's characteristics such as type, number of buttons/outputs and ID. A name field can also be set or left as the default which will count sequentially. Device names in the system are purely to ease later identification and aren't used as part of the communications system. This screen will also show a warning if a device has already had any of its configurations

set. This can be safely ignored if you intend to set another button/output on the device or clone its settings to a new one.

If 'Next' is pressed, the device info will be saved to the database and the system will await another device to be associated with. If 'Cancel' is pressed the system will close the dialogue and another two devices will need to be scanned.

After 'Next' is pressed for the second time after two unique devices have been scanned, the app will automatically be redirected to the appropriate page based on one of the three scenarios above:

1. Pairing Switch & Driver

   The form will allow you to select a single button on the switch and a number of outputs on the selected driver to be controlled by that button. By default, the first non-assigned switch button will be selected. Pressing 'Pair' will save the info for the switch and driver to the database and attempt to set their configurations via the **DARC*bus*** network.

2. Copying a Switch to Another Switch

   Using this functionality is useful for having switches which control the same driver outputs such as having identical switches at either end of a hallway.

   The order the switches are scanned will determine which has its settings copied to the other. The page displays tick boxes for each button on the source switch to be copied to the second one scanned. The maximum number of tick boxes which can be selected is based on the number of buttons available on the second switch.

   If the switches have the same number of buttons, each button selected will be copied directly to the destination button of the same position. If the number of buttons differ, each selected input button will be added to the destination sequentially (I.e. if a 3 button switch is copied to a 4 button switch with buttons 1 and 3 selected to copy, buttons 1 and 2 on the 4-way will control the same devices at buttons 1 and 3 on the first switch.)

   Pressing duplicate will save the second switch's info to the database and try to update its configuration over PLC. The original switch will not be changed.

3. Copying a Driver to another Driver

   Using this functionality is useful for having drivers which turn their outputs on at the same time such as lighting a whole room with many lights using a single switch button.

   Alternatively, this can be used to pair devices which act as both switches and drivers (Such as the Mains Adaptor) with other drivers. Since copying drivers automatically assigns group addresses to all outputs, pairing a dual switch/driver device with another driver will pair such that pressing a button on the dual device will power on both its output and the same output on copied driver.

   The order the drivers are scanned determines which has its settings copied to the other.

Pressing duplicate will automatically copy as many outputs from the first driver to the second driver as possible (all outputs if the number of outputs are the same). These settings will be saved to the database and sent to the second driver via PLC. The original driver will not be changed.

On any page, when configuration is complete or if the 'Cancel' button is pressed, you will be returned to the scanning page to configure more devices.

It is highly recommended you test all switches physically to ensure that they control the intended drivers. When all devices are configured, the web-app can be closed on your smartphone and the installer portal can be unplugged from power.

Safety Instructions

Safety is always paramount.

- Always switch off the power before touching any wiring
- Always use the covers provided with the GP Drivers to protect from accidental power contact
- Never remove the cover from the back of the switch
- Only Licenced Electricians may perform installation, wiring and alterations
- The switches and Drivers (GP Driver, Dual Relay, and TE Dimmer) are for indoor use only
- No product modification is allowed
- Do not use in environments which exceed the temperature ratings of the products
- No user serviceable parts inside
- Do not use in wet areas.

Specifications

Switch Specifications

Dimensions : Same as Schneider/PDL600 series

118mm x 74mm (with stainless steel cover plate)

10mm proud of the wall it is mounted on

13mm needed from the rear of the front plastic plate. (Can be used inside 13mm gib or with most sliding cavity doors

Space inside wall = 74mm x 52mm x 13mm

Can be used with 90% of all commonly available flush boxes. (Not with the PDL in-concrete flush box)

Can be used with Schneider PDL 600 Series cover plates in white, black, or brushed chrome.

Weight <100g

Force required to activate switch : 4 Newtons

Switch life >100,000 presses

Driver Specifications

	Dimensions : 163mm x 45mm x 31mm
Driver Output levels	(40 W unit) 25-45V DC output range, 40W max output
	(20 W unit) 15-35V DC output range, 20W max output
Programmable Limits	Always use the driver pre-programmed for the intended luminaire

System Specifications

No of devices (switches/drivers) in a 'network'	65533
Programmable Minimum light level	0.5%
Programmable Maximum light level	100% of an individual luminaire's limit
Rate of change	Programmable – from 0.5 seconds to 10 minutes
Switch on time (From power first applied)	Less than 3 seconds
Communication time (From button press)	Less than 250mS
Standby Current	<0.55 W per device

230V AC 1-3 way Switch Plate (PIR Capable)

Specifications

AC Input

Nominal Input Voltage	230V AC
Input Voltage Range	207 – 253V AC
Frequency Range	45 – 55Hz
Power	approx. 0.55W idle, 2.5W transmitting
Input Fuse	in phase P.T.C. Thermistor
Auxiliary	PIR & Luminance sensor, can be fitter in-place of the middle button.

Communication

Power Line Carrier	9600 bps

Protection

Input voltage	Auto shutdown, auto restart when correct voltage restored
Input Surge	1.5kV Phase to Neutral

Environmental Requirements

Ambient Temperature	-20°C to +50°C
Humidity	5-95% RH (non condensing)

Compliances

New Zealand Standards	AS/NZS60669.2.1 (switch) Suppliers Declaration of Compliance available on line
Safety	EN60950
Immunity	CISPR24
Emissions	CISPR22
AC Harmonics	EN 61000-3-2
AC Flicker and Fluctuations	EN 61000-3-3

Models

Single Switch (white button, green backlight)	DTSW10A23—010GWH
Single Switch (Black button, green backlight)	DTSW10A23—010GBK
Single Switch (white buttons, green backlight)	DTSW10A23—030GWH
Single Switch (Black buttons, green backlight)	DTSW10A23—030GBK

230V AC 40W Controllable LED Driver

Specifications

AC Input

Nominal Input Voltage	230V AC
Input Voltage Range	207 – 253V AC
Frequency Range	45 – 55Hz
Power Factor	>0.99
Peak Efficiency	90% at 50V output
Maximum Input Current	0.25A
Input Fuse	In Phase
Input In Rush	<2x maximum input current
Standby current consumption	0.55 W approx.

DC Output

Maximum Output Voltage	60V DC
Output Voltage Range	27 – 45V DC
Constant Power Output	20 – 40W
Start Up Time	<3 seconds from initial power on.
Switch on time (from comms signal)	<250 mS

Auxiliary Header

Four wire auxiliary connector; +24-60V, Ballast 0V, Isolated digital input, Isolated digital output

Auxiliary Board Options

PIR/Luminance Sensor

Communication

Power Line Mains Carrier	9600 bps

Protection

Input voltage	auto shut down, auto restart when correct voltage restored
Input Surge	2.5kV Phase to Neutral
Over Temperature	Ballast Temp and remotely via AUX Header
Short Circuit	
Output Over Voltage	

Isolation

Input to Output	4000V DC (double insulation)
Input to Chassis	3000V DC
Output to Chassis	100V DC

Environmental Requirements

Ambient Temperature	-20°C to +50°C
Max Case Temperature	+90°C (automatic turn down)
Max Altitude	1000m asl (derated temp specs above this)
Humidity	5 – 95% RH (non condensing)

Compliances

New Zealand Standards	AS/NZS61347.2.13 (Driver) Suppliers Declaration of Compliance available on line
Safety	EN 60950
Immunity	CISPR24
Emissions	CISPR22
AC Harmonics	EN 61000-3-2
AC Flicker and Fluctuations	EN 61000-3-3

Models

40W Driver	DTDR10A23--004000

230V AC 20W Controllable LED Driver

Specifications

AC Input

Nominal Input Voltage	230V AC
Input Voltage Range	207 – 253V AC
Frequency Range	45 – 55Hz
Power Factor	>0.99
Peak Efficiency	90%
Maximum Input Current	0.12A
Input Fuse	In Phase
Input In Rush	<2x maximum input current
Standby current consumption	0.55 W approx.

DC Output

Maximum Output Voltage	40V DC
Output Voltage Range	17 – 37V DC
Constant Power Output	10 – 20W
Start Up Time	<3 seconds from initial power on.
Switch on time (from comms signal)	<250 mS

Auxiliary Header

Four wire auxiliary connector; +24-40V, Ballast 0V, Isolated digital input, Isolated digital output

Auxiliary Board Options

PIR/Luminance Sensor

Communication

Power Line Mains Carrier	9600 bps

Protection

Input voltage	auto shut down, auto restart when correct voltage restored
Input Surge	2.5kV Phase to Neutral
Over Temperature	Ballast Temp and remotely via AUX Header
Short Circuit	
Output Over Voltage	

Isolation

Input to Output	4000V DC (double insulation)

Input to Chassis	3000V DC
Output to Chassis	100V DC

Environmental Requirements

Ambient Temperature	-20°C to +50°C
Max Case Temperature	+90°C (automatic turn down)
Max Altitude	1000m asl (derated temp specs above this)
Humidity	5 – 95% RH (non condensing)

Compliances

New Zealand Standards	AS/NZS61347.2.13 (Driver) Suppliers Declaration of Compliance available on line
Safety	EN 60950
Immunity	CISPR24
Emissions	CISPR22
AC Harmonics	EN 61000-3-2
AC Flicker and Fluctuations	EN 61000-3-3

Models

20W Driver	DTDR10A23--002000

230V AC 150W Trailing Edge Dimmer

Specifications

AC Input

Nominal Input Voltage	230V AC
Input Voltage Range	180 – 270V AC
Frequency Range	45 – 55Hz
Standby current consumption	1.0 W approx.

Output

Power Output	LED <150W output Incandescent <150W output

Communication

Power Line Mains Carrier	9600 bps

Protection

Input voltage	auto shut down, auto restart when correct voltage restored
Input Surge	2.5kV Phase to Neutral
Over Temperature	Ballast Temp and remotely via AUX Header

Environmental Requirements

Ambient Temperature	-20°C to +50°C (automatic turn down)
Humidity	5 – 95% RH (non condensing)

Compliances

New Zealand Standards	AS/NZS61347.2.13 (Driver) Suppliers Declaration of Compliance available on line
Safety	EN 60950
Immunity	CISPR24
Emissions	CISPR22
AC Harmonics	EN 61000-3-2
AC Flicker and Fluctuations	EN 61000-3-3

Models

Trailing Edge Dimmer	DTDM10A23--0000 00

230V AC 10A Dual Relay Driver

Specifications

AC Input

Nominal Input Voltage	230V AC
Input Voltage Range	180 – 270V AC
Frequency Range	45 – 55Hz
Standby current consumption	1.0 W approx.

Output

Power Output	5A per output 10A Maximum from one output only

Communication

Power Line Mains Carrier	9600 bps

Protection

Input voltage	auto shut down, auto restart when correct voltage restored
Input Surge	2.5kV Phase to Neutral
Over Temperature	Ballast Temp and remotely via AUX Header

Environmental Requirements

Ambient Temperature	-20°C to +50°C (automatic turn down)
Humidity	5 – 95% RH (non condensing)

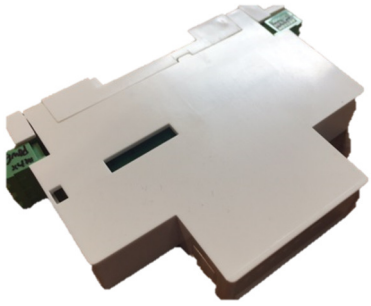
Compliances

New Zealand Standards	AS/NZS61347.2.13 (Driver) Suppliers Declaration of Compliance available on line
Safety	EN 60950
Immunity	CISPR24
Emissions	CISPR22
AC Harmonics	EN 61000-3-2
AC Flicker and Fluctuations	EN 61000-3-3

Models

Dual Relay Driver	DTRD10A23--0000 00

230V AC 20A DIN Filter



Specifications

AC Input

Nominal Input Voltage	230V AC
Input Voltage Range	180 – 270V AC
Frequency Range	45 – 55Hz

FILTER

Maximum Through Current	20A
Stop Frequency	Centred around 132 KHz

Environmental Requirements

Ambient Temperature	-20°C to +70°C (automatic turn down)
Humidity	5 – 95% RH (non condensing)

Mechanical DIN RAIL Mounting 18mm wide

Compliances

Safety EN 60950

Models

20A Filter DTFL10A23--0020 00