

Wireless technology enhances layout operations by not tethering controls to connection panels in the layout fascia. You can move to any point on the layout where operations, such as shunting, take place.



Wireless DCC with Dynamis

An introduction to the use and benefits of the Bachmann Dynamis wireless system by Nigel Burkin

INTRODUCING DYNAMIS

Not having the inconvenience of cables connecting handsets to panels in the layout fascia opens up the enjoyment of layout operation. You can stand exactly where operations are taking place. The Dynamis DCC system package (36-505) is an entry level set that will allow you to enjoy that freedom. It is a fully-fledged DCC system capable offering 4-digit addressing, control of up to 100 accessories (25 accessory decoders of 4 outputs for each), control of 20 mobile decoder functions and a 2.5 amp power rating which should be sufficient for six modern standard locomotives equipped with 5-pole skew wound motors to be operated at the same time. Dynamis has been used on my own portable N gauge layout and the fleet of 20 or so locomotives and multiple units in contact with the track, with three in operation at one time does not exceed the current rating of 2.5 amps.

The entry level set comes complete with an advanced handheld wireless handset (called a throttle or cab because it represents the driving controls of a locomotive), a safety lanyard (so to avoid dropping the throttle)

together with the base station/receiver assembly, a wall plug transformer and an instruction booklet.

The entry level set is an important part of the Dynamis system because it is the heart of Dynamis. The base station (labelled on the casing as the 'Command Station') contains the command station and booster that are the key components of any DCC system. In making the entry level set the core component of the system, it only takes a hardware upgrade, the Pro Box, to dramatically expand Dynamis with many additional features and benefits. At the same time, the Dynamis Command Station box does not become an ancillary controller of limited value after the Pro Box has been purchased, which is sometimes the case with other DCC systems. Nothing is thrown away or made redundant when upgrading with a Pro Box.

The low cost of the entry point Dynamis set makes it the perfect way to make a start with wireless DCC and with its supplied transformer together with advanced DCC features included in the set at the start, the system beats many other entry level

packages. Plus, there's the added interest of wireless control using infrared technology together with a core system based on ESU ECoS DCC technology which is tried, proven and highly regarded. Dynamis (and the Pro Box) has an NMRA conformance seal, the symbol for which is displayed on the box. NMRA conformance is highly valued in the DCC community and indicates that a good level of DCC compatibility from the command station, to track and decoders has been achieved.

SO WHAT DOES WIRELESS MEAN AND HOW DOES DYNAMIS MAKE THE OPERATING EXPERIENCE DIFFERENT?

Wireless = no cables and flexible operation...

Removing a throttle cable from the equation introduces some different factors for layout operations. Roaming operation becomes the norm. This means that you can following a train around the layout, obeying signals and enjoying the experience of train driving right to the point where the action is taking place. Another benefit is being

able to observe operations on parts of the layout otherwise inaccessible unless a tethered throttle was put down momentarily. This is helpful when checking for faults or observing the passage of trains over a point on the track where derailments are taking place so a repair can be made. In short, wireless operation is the ultimate in flexibility of train control and can increase the enjoyment of layout operation considerably.

Wireless throttles require power and batteries are the obvious choice. The Dynamis throttle accepts four AAA batteries that last some time, especially if operators remember to switch the throttle off during breaks and after the operating session has concluded. However, when planning an operating session, remember to have a good supply of fresh batteries to hand because you can guarantee that at least one set will die during an evening of operation. The Dynamis handset will take rechargeable batteries, so have a 'spent battery' container to hand near the layout during operating sessions if using rechargeable batteries.

THE CONTROLLER (THROTTLE)

Only one controller can be supported by the entry level set even through more than one train can be set moving at a time. Control will be restricted to one train even if two or more are running on separate circuits. The Dynamis system stores up to 40 locomotive addresses in a 'roster' stack; the numbers being recorded as locomotives are called up. There is the option to enter identification names in Dynamis for easy locomotive identification. Switching from loco to loco is simple when the roster stack holds the various locomotives' identity. The Pro Box enhances much of this, but more on that later!

The Dynamis handset is quite a sophisticated beast by DCC standards; incorporating ergonomic design, a joystick controller and a large, clear LCD screen that is back-lit. A great deal of information on the control of a train, including a sliding scale and numeric read-out for locomotive speed steps is displayed. Despite the high level of sophistication, the handsets are intuitive to use and provides one button, one touch control for all the important features such as double heading (consisting) and turnout control selection. Newcomers to DCC should find the handsets enjoyable to use.

The use of extensive menus for operational features is becoming less of a feature in modern throttles and single button presses for turnout (accessory) decoder control, lights and so on makes it easy to use and

closer to the controls of full-size locomotives (except turnout control, of course, which is a convenient addition for railway modelling). There is a menu in the throttle for entering data such as locomotive identities and that is simple to navigate too.

The joystick provides locomotive control, push it forward and the locomotive accelerates according to the decoder settings. Pull the joystick back and speed is lost. The handset supports 28 and 128 speed steps, the latter is better for finer levels of locomotive control. To select from the locomotive stack in one motion, push the joystick to one side or the other to scroll through the saved locomotive identities. Choosing options, be it entering a locomotive or accessory decoder address or a saved locomotive address, is simple through a single button press for enter as indicated by a tick on the LCD screen.

IR RECEIVERS

Locating the Command Station correctly with the receiver mounted on top when using the entry level set is very important to ensure there is a clear line of sight between Dynamis handset and the receiver. There is always the chance of losing contact between receiver and handset, even allowing for the signal bouncing off light coloured walls. When signal loss does occur, the selected locomotive will run as if a tethered throttle had been unplugged - it will run in accordance to the last change on the throttle. To avoid problems should contact be lost for more than a very short period of time, the system has a 'Track Timeout' that is a timed delay between the loss contact and the track power being cut. This ensures that only small interruptions will spoil the enjoyment of using the system. The timeout period can be adjusted to suit individual requirements.

To prevent such interruptions, locate receivers as high up the wall of the layout room as you can and install additional receivers using the IR Expansion box and cables should there be any risk of losing contact due to a corner location, layout back scene or other obstruction. The Pro Box package includes the IR Expansion box and an additional IR receiver.

LIMITATIONS OF THE ENTRY-LEVEL SET:

The Dynamis entry-level set does not have a programming or service track output, ('Pro Box' provides all DCC programming modes and readout required for advanced CV programming). Address programming is through the main track output. While this is not a problem for small layouts operating only a handful of locomotives using short 2-digit

addresses, the modeller should be aware that any and all locomotive decoders in contact with track power at the time a programming instruction with a 4-digit address is broadcast will receive and act upon the instruction.

Consequently, all but the intended recipient of the programming instruction should be removed from the layout. This avoids having a fleet of locos all taking the same 4-digit address with all the inconvenience that can cause when a new model is introduced! To avoid the inconvenience of removing all locomotives from the layout, consider adding an isolated siding or programming track to the layout for Ops Programming. A double pole, double throw switch should be included in the power leads circuit between the layout and Dynamis so power can be switched to the track to create a programming zone isolated from the rest of the layout. There is no longer any need to remove every locomotive from the track to programme a new 4-digit address or other CV change to a new locomotive or decoder.



2: The Bachmann Dynamis entry-level system is a 2.5 amp set which includes a command station, receiver, hand held wireless throttle and wall mount power supply. This article looks at the fundamentals of Dynamis and how to put it to work.



3: The Pro Box expands the entry-level Dynamis system with advanced features including multiple train control and advanced programming using a service track. The expansion set comes with the Pro Box itself, an additional IR Receiver, cables and an adapter for expanding the IR receiver network.



4: The same handset (throttle) supplied with the entry level set is used when the system is upgraded with Pro Box. Features of the wireless IR handset include:

- A: Alpha numeric key pad.
- B: Headlight button.
- C: Joystick locomotive power controller – up/down to increase or reduce speed, left or right to scroll through the locomotive stack.
- D: Direction button.
- E: Emergency stop button and short circuit cut-out re-set.
- F: On-off switch.
- G: Locomotive address selection button for entering a new numeric address.
- H: Headlight or running light indicator.
- I: Indicator shows the stop feature is activated.
- J: Two visual scales for measuring speed steps on the large back-lit LCD screen.
- K: Lanyard attachment to the base so the handset can be held the right way up.



5: You will need batteries for the handset! While the first set of batteries are supplied with the handset, rechargeable batteries will be the best solution in the long term. Should there be a need to store the system for any period of time, remove the batteries to save power and reduce the risk of leakage.



6: The Command Station unit supplied with the entry point set is the heart of the system even when a Pro Box is attached. The ports in the rear are simple: a power supply and two outputs for track power bus offering two options for making a connection to the layout. Note that there is no separate programming track port – the track output port becomes the programming (service) track port when a Pro Box is added.



7: The IR receiver sits on top of the command station when set up in entry-level mode.

INTRODUCING THE PRO BOX EXTENSION PACK

The Pro Box (36-508) is an extension pack to the entry level Dynamis package (36-505) that adds many more features to the system. It enables the use of up to four wireless throttles at the same time and the addition of more receivers (36-509) to improve infrared coverage thus increasing the system's functionality dramatically.

The Pro Box package includes the Pro Box itself that has the same type of casing as the command station. Both the command station and Pro Box are labelled on the casing, so there should be no confusion. The two plug neatly together, with the command station on top. Also supplied is an additional IR Receiver, an IR Extension module providing four ports into which IR Receiver cables are plugged. No additional handsets are supplied with the Pro Box kit, although they are available separately.

Pro Box provides additional features including full programming capability that allows the readout of CV values as well as programming on a separate, electrically

isolated programming or 'service' track. Advanced programming is also possible on the main layout track – no longer are the programming commands 'broadcast' so every decoder will pick them up, but are targeted to a specific locomotive. Pro Box provides ECoS compatibility too – there is an ECoS port in the back of the Pro Box so ECoS devices can be connected to Dynamis, an area that needs further investigation by the author!

Upon starting the system for the first time, the throttles are synchronised with the Pro Box as they are switched on so any locomotive roster originally entered into the throttle used with the Dynamis system prior to the upgrade is shared with all throttles. Synchronisation is automatic and may take several minutes. The same can happen if a throttle goes out of range from the Pro Box and then returns after it has been deleted from the system. A request for synchronisation will be made at reconnection. During synchronisation, throttles must not be switched off.

The instructions should be read carefully regarding the setting of handset IDs, synchronisation and the correct order of starting up and shutting down. Also supplied is a simple jumper for setting the system address, called 'BaselD' to avoid conflict with similar systems should the layout be used at an exhibition. The BaselD jumper default setting is zero and does not need to be changed unless there is another Dynamis system in use nearby. To change the BaselD, fit the supplied jumper plug to the 8-pin terminal on the top of the Pro Box. The terminal offers four BaselD address options (0 to 3), three of which are set with jumpers.

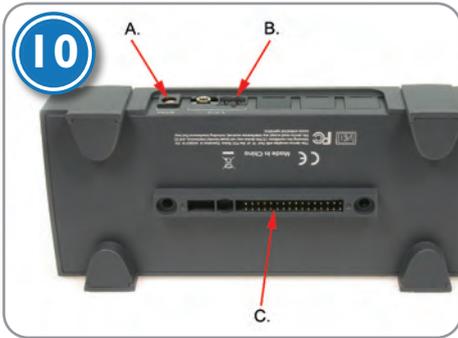
With more than one handset connected to the system, the process of taking control of a locomotive being driven by another operator (also called stealing) is introduced. A locomotive can be 'stolen' simply by selecting it and operating any one control or function.



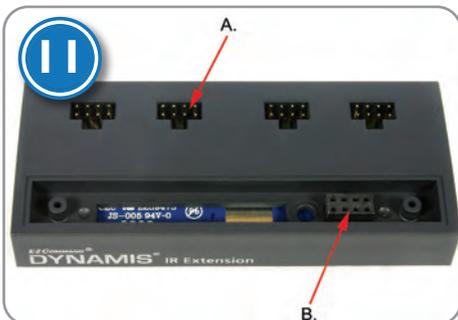
8: The Pro Box is a module built with the same casing as the command station. There are two multi pin connectors in the top. The 8-pin connector on the right is used to set the BaselD address if the system is used within range of another Dynamis system.



9: The rear of the Pro Box with track power bus port and ECoS link port.



10: A view of the underside of the command station. It sits on the Pro Box when one is used and communication between the two is by a multi-pin connector in the base of the command station (C). Note the power supply port (A) and track power bus port (B).



11: Key to expanding the IR Receiver network is the IR Extension module that sits atop the command station. It allows up to five IR Receivers to be connected to the system including one located directly on top of the command station.



12: The Command Station sits neatly on top of the Pro Box. There are no cable connections between the two and take care not to bend any pins!

PUTTING DYNAMIS TO WORK:

The perfect layout to demonstrate Dynamis and Pro Box is my small N gauge portable layout called 'Dudley Heath'. It has two scenic sides with the fiddle yard located at one end. Overall, it is 100 inches in length and 33 inches wide, a typical sized layout for home and exhibition use. The base station and Pro Box were placed in a tray fitted to the control panel which was designed to safely accommodate a control system – it is important to have a safe place to accommodate the DCC system.

To start, the basic Dynamis set was installed with the power lead plugged in the back of the box. The ends of the power bus were screwed into the supplied plug and that was plugged into the rear of the base station. Once the single receiver module was plugged in the top of the box, the system was ready for power and operations. The 2.5 amp power rating was more than adequate to power the layout and multiple train operation. I ran one train continuously on one line whilst the other was under control. There's enough power for two main line trains to run and control of shunting in the yard. Should I need more power in the future, I can upgrade using a 5amp booster and introducing a second power district.

Now, should a friend or two turn up wanting to join in the fun, the basic system must be expanded with the Pro Box to enable the use of additional controllers. By this stage, due to the double-sided nature of Dudley Heath, I determined that an additional receiver would be beneficial too. To install Pro Box, I disconnected all of the leads and unplugged the transformer. The single receiver was removed from the top of the Dynamis base station too. Closely following the instructions, the Command Station box was fitted to the top of the Pro Box. The IR Extension box was placed on top with the original receiver plugged to the top of that. The additional receiver and lead supplied with Pro Box was connected to the IR Extension box with the lead fed along the layout to expand coverage.

Next came the connections to the layout wiring itself. Dudley Heath was built with a separate programming track. The two wires feeding the programming track were connected to the track port in the Command Station. The power bus leads plug into the Pro Box. Upon powering up, synchronisation takes place between Pro Box and the throttles. Once complete, friends are able to operate trains independently of the original throttle supplied with the starter package.

In the next article on Dynamis, I will look at the basic wiring of a layout together

with installing layout programming accessory decoders. After all, there's so much more to this system than may be covered in one article!



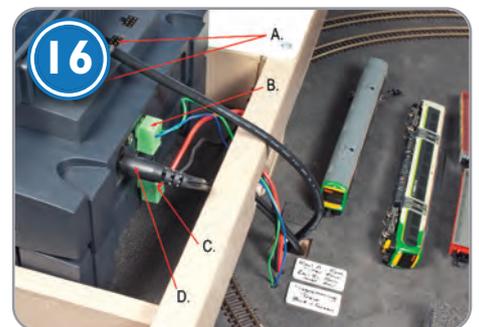
13: Setting up the entry-level package on the Author's N gauge layout Dudley Heath. A small screwdriver is required to connect wires to the screw connectors supplied with Dynamis.



14: Should friends turn up wanting to enjoy the layout, a Pro Box is added enabling the control of up to four trains simultaneously using wireless throttles.



15: To improve coverage for the throttles, an additional receiver was installed using an IR Extension box and cable.



16: The setting up is complete with IR Extension box and cable (A) plugged into the Command Station that sits on top of the Pro Box. The programming track is plugged into the Command Station (B) and the layout power bus into the track port in the Pro Box (C). The power supply for Dynamis is still plugged into the Command Station box (D).



17: It is good practice to label your wiring!



18: The additional IR Receiver is located for maximum coverage. It is important to have clear lines of sight between the receivers and handsets to minimise the risk of signal loss.



19: The benefits of DCC can be enjoyed using Dynamis including sound and constantly illuminated and independently controlled running lights.



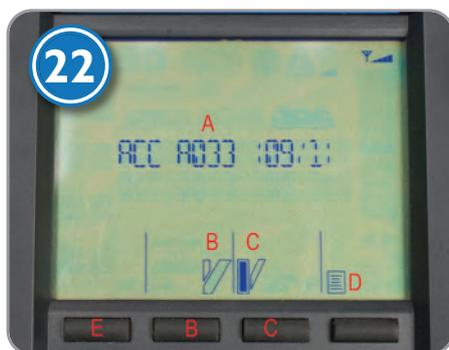
20: The addition of the Pro Box makes multiple train operation with more than one wireless throttle possible. The design of the author's layout supports the simultaneous operation of three trains: two on the main line and one in the yard, requiring the Pro Box expansion to the entry level package and two additional throttles.



USING THE HANDSETS (THROTTLES) IN PICTURES:

21: The standard screen showing a selected locomotive, numbered 6008. Symbols showing on the screen are as follows:

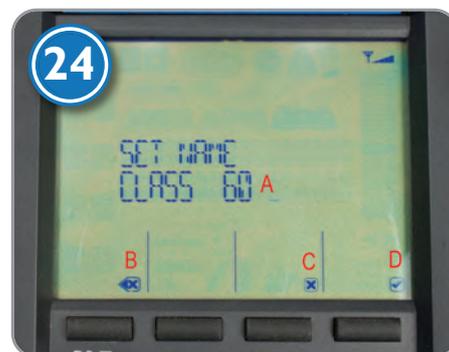
- A: Power is switched off.
- B: Diesel loco symbol.
- C: Locomotive 6008 is selected.
- D: Locomotive name as set by the system.
- E: Speed steps selected and current speed.
- F: Speed steps bar.
- G: Locomotive address selection.
- H: Main Menu.



22: Accessory control is activated by pressing the left hand button (E).
 A: Accessory number and device number.
 B: Turnout indicator and associated button (reverse or thrown position).
 C: Turnout indicator and associated button (normal position).
 D: Menu button.



23: Locomotive naming option is found in the menu.



24: Renaming a locomotive for simple identification in the roster stack.
 A: Delete old name using back button. Alpha numeric key pad is used to enter a new name.
 B: Back button.
 C: Action cancel button.
 D: Confirm by pressing the 'tick' key.



25: Changing the locomotive symbol is simple. Use the menu once again.
 A: Use the button to switch between symbol choices.
 B: Each symbol is clearly displayed.
 C: Use the 'tick' key to confirm the selection.



26: The symbol will be displayed on the main screen together with other information relating to the driving of the selected locomotive.
 A: Note the low battery level indicator!
 B: Locomotive symbol.
 C: Consisting symbol and related button (add to consist).
 D: Menu button and symbol.



27: Speed step changes are made through the menu – select the edit speed screen. Changes are specific to the selected locomotive.



28:A: Speed step choices are made using the selection buttons.
B: Cancel choice.
C: Confirm choice.



29: Locomotive address selection menu offers either Ops Programming (On Main Track).



30:A second setting offers programming or service track programming of the locomotive address.



31: Selecting a new address, using figures 0-9999 via service track programming.
A: Enter the new address using the keypad.
B: Mistakes can be deleted using the back button.
C: Confirm the new address by pressing the programming button.

Product Details

Bachmann Dynamis DCC 2.5A entry-level set with transformer and one controller.
Catalogue number 36-505.

Bachmann EZ Command Pro Box.
Catalogue number: 36-508

Additional handset (throttle).
Catalogue number: 36-507.

Additional wireless IR receiver.
Catalogue number: 36-509.

More helpful information can be found at www.bachmann.co.uk/service/digital_top.php