BMX Track Transponder System Installation Best Practice Guidelines

Version
07.19.A

These Transponder System standards may be used in conjunction with the track regulations of BMX New Zealand.

Contents

1 Purpose

These guidelines are for the installation of a transponder race system at a BMXNZ affiliated Club BMX track to an accepted standard to run transponders in a BMX race event, within the BMXNZ rules and regulations.

Quick Overview:

The MyLaps Transponder system for BMXNZ uses 3 timing positions around the track.

1. Gate drop.
2. Start Hill.
3. Finish line.

The Gate Drop is picked up with a cable run from the gate controller (Progate) to the first Decoder. An Interface is attached to the Controller and connected to the Start Hill Decoder via a 2-wire cable.

The Start Hill Loop is ideally put at the bottom of the Start hill about 5 to 10m from the gate. This measurement is not critical and can go wherever suits, however, it does need to be at a point where riders would cross the loop between 1.5 and 10 seconds after the gate drop.

The Finish loop is made up of two parallel conduits run across the track. The first conduit is buried 600mm before the finish and the second conduit is under the finish line. The finish is when the transponder is exactly in the middle of these two conduits. With the transponder mounted on the fork this puts the front wheel just touching the finish.

Intermediate Loops. Extra timing loops can be added at various positions around the track. These loops give split times around the track. Uses for these intermediates are for coaching/training and are not required as part of BMXNZ specifications for race scoring.

Further in this document is the recommended method of installing the loops in the track.

BMXNZ Accepted Standard for BMX Tracks

The BMXNZ accepted standard will allow any club of event body sanctioned by BMXNZ to record the starting of a moto and to record the finish position and time of each participant.

Additional options beyond the BMXNZ Standard

Clubs may at any time extend the number of decoders and loops beyond the BMXNZ standard. This is acceptable. These options may deliver extended training opportunities and event outcomes (holeshot or segment speeds) but the minimum BMXNZ standard is the only requirement.

2 Full MYLAPS Installation

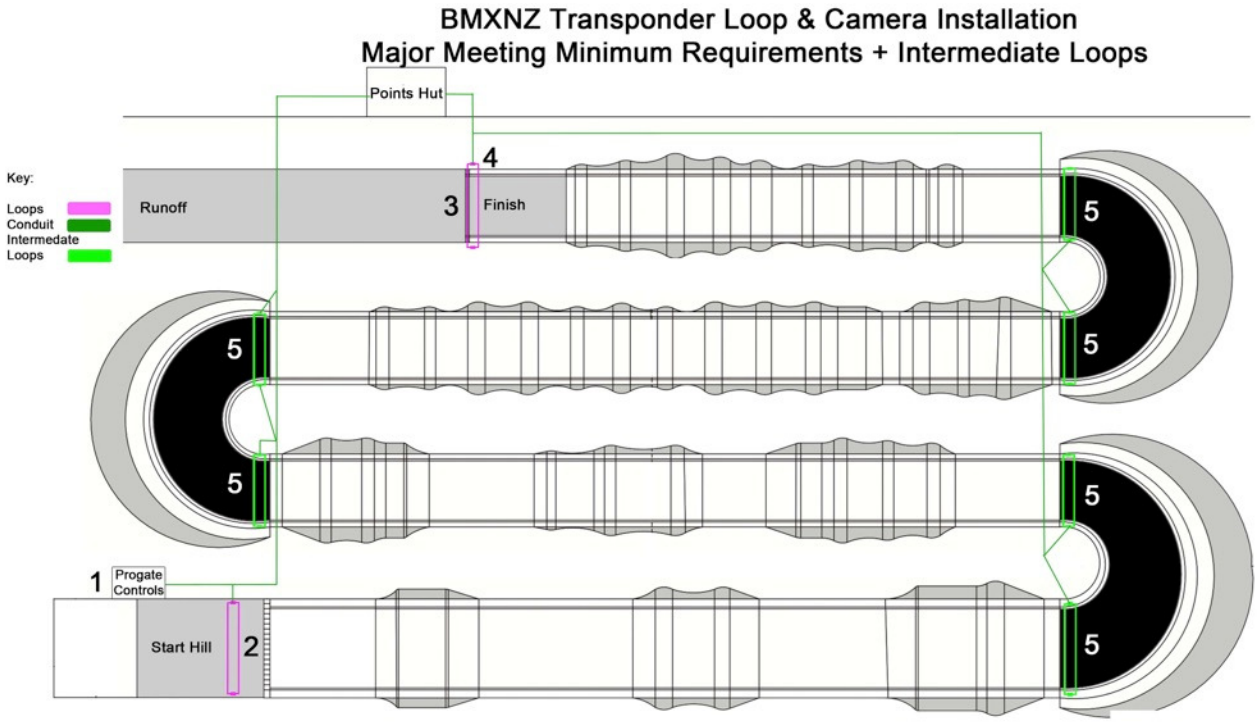
BMXNZ Standard

As noted in the purpose this is the basic BMXNZ standard requirement to deliver the required results in a BMXNZ Transponder Scored race.

- **2 X Prochip Decoders**
- **2 X MyLaps GPS units**
- **2 X 5M Coax Connections (to loop)**
- **1 X Prochip Detection Loop 9m for finish line**
- **1 X Prochip Detection Loop 12m for start hill**
- **2 x Starting Boxes from ProGate to detect gate drop (A and B)**
- **RG6 Quad Shield coax – by the metre (from 5M Coax Connection to decoder location)**
- **2 Core Signal cable – by the metre (from start box A to start box B next to decoder location)**
- **2 X Cat5e or Cat6 Cable from Finish Line to Points Hut for Camera**

As well as the above, a third decoder and small loop may be necessary for rider registration, however, the finish line may suffice as a check loop.

The club may, as they wish, add more decoders and loops to the installation for training purposes. These are 'intermediate' loops.



1. 2 core 'bell' wire for starting control - run from Progate control to points hut
2. Start Loop - Minimum of 2 meters from gate, max of 20 meters from gate
3. Finish loop - one side of loop MUST be on finish line, other side 600mm before finish line.
4. 2 X minimum Cat5e on outside of track for BMXNZ Camera.
5. OPTIONAL: Intermediate Loops - NOTE: CONDUIT SIZE WILL VARY WITH EXTRA COAX CABLES

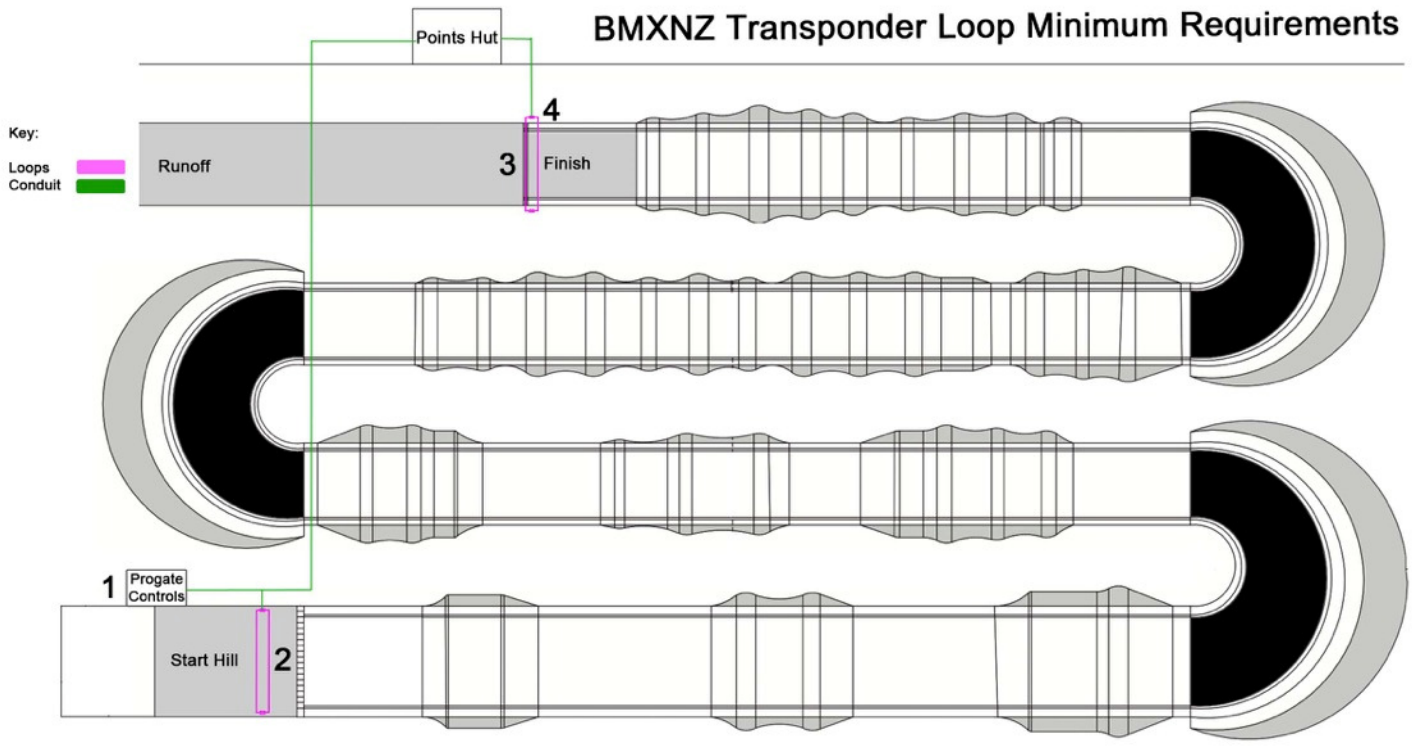
3 Cabling Only Installation

Ready for a BMXNZ Transponder Scored Meeting

This option is for clubs and track to be ready for BMXNZ to run their existing decoders on the club loops. This is the minimum BMXNZ standard requirement to run a BMXNZ Transponder Scored Meeting.

- **2 X 5M Coax Connections to loops**
- **1 X Prochip Detection Loop 9m for finish line**
- **1 X Prochip Detection Loop 12m for start hill**
- **RG6 Quad Shield coax – by the metre (from 5M Coax Connection to decoder location)**
- **2 Core Signal cable – by the metre (from start box A to start box B next to decoder location)**
- **2 X Cat5e or Cat6 Cable from Finish Line to Points Hut for Camera**

BMXNZ will supply, (for the duration of the meeting), decoders, gps units and start boxes.



1. 2 core 'bell' wire for starting control - run from Progate control to points hut
2. Start Loop - Minimum of 2 meters from gate, max of 20 meters from gate
3. Finish loop - one side of loop MUST be on finish line, other side 600mm before finish line.
4. 2 X minimum Cat5e on outside of track for BMXNZ Camera.

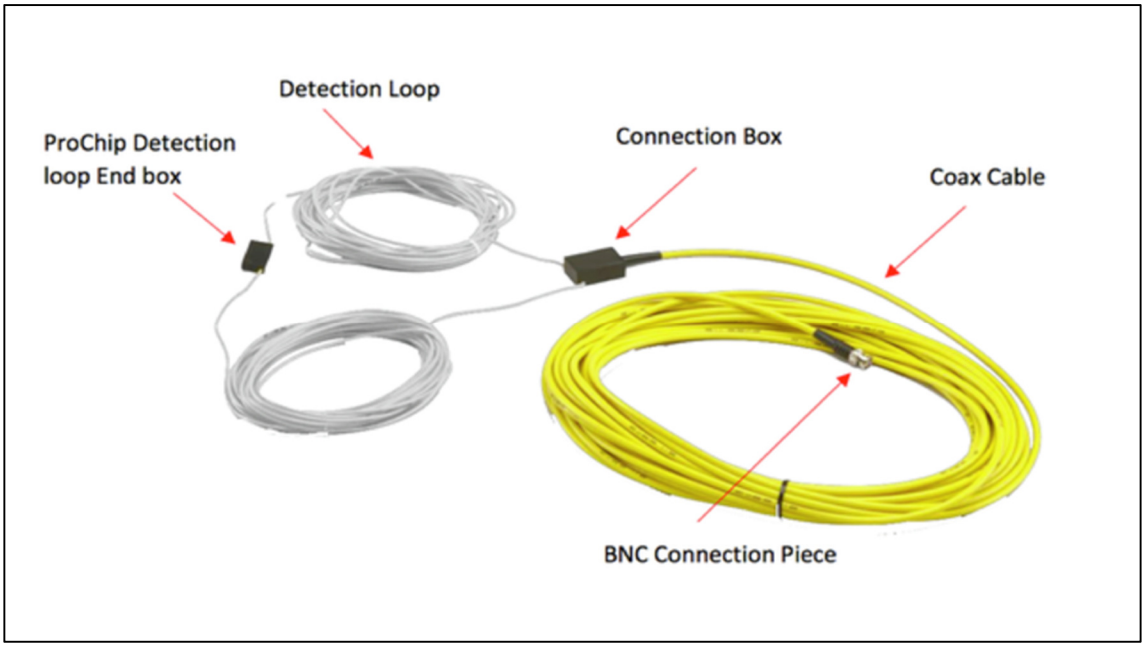
4 Loop and Cable Installation

Installing loops and the associated cabling will require trenching and might need cutting of asphalt. Cables that are to be installed under the track lime surface must be in conduit and buried no more than 100mm deep. Coax and other cables, (from loops to decoder location), should also be run in conduit. For conduit runs infield or outside of the track area, we recommend that you bury the conduit at least 300mm deep. FYI: NZ Regulations for power is no less than 600mm, Chorus is 450mm for communications.

Conduit recommendation is 25mm for one or two coax, 32mm for three and so on and so on. Depending on the number of loops you intend to cater for, you may need conduit or ducting 50mm or larger. It is a good idea to include a draw wire in the conduit and keep the bends to a minimum – Where possible, install access pits to ease cable management between the track. Cat5e or Cat6 makes for a good draw wire with the option of using it later on for networking.

For loops installed in asphalt, concrete etc, cuts will need to be made. These cuts only need to be deep enough for the loop wire to be a couple of mm below the surface. Run a bead of silicone to protect and keep the loop in place and also to fill the cut.

Use ONLY RG-6 Quad-shield coaxial cable from decoder to loop connections



MyLaps Detection Loop and MyLaps Coax Cable

Decoder Cabling

The Decoders are normally in the points/scoring hut. Cables are required from the decoders to the loop positions. The cables from the Start Hill and Finish loops are coax type cables. MyLaps can supply coax runs up to 100m, whereas your local electrical wholesaler can supply RG6 Quad-Shield coax by the meter or drums of 305m – this will be a cheaper option and you will need to terminate with F-Type connectors.

Coax cabling supplied from MyLaps comes in the following lengths:

Coax

- 20m and connector box
- 50m and connector box
- 100m and connector box

Detection Loop Cabling

Loops are supplied from MyLaps and are in the following lengths:

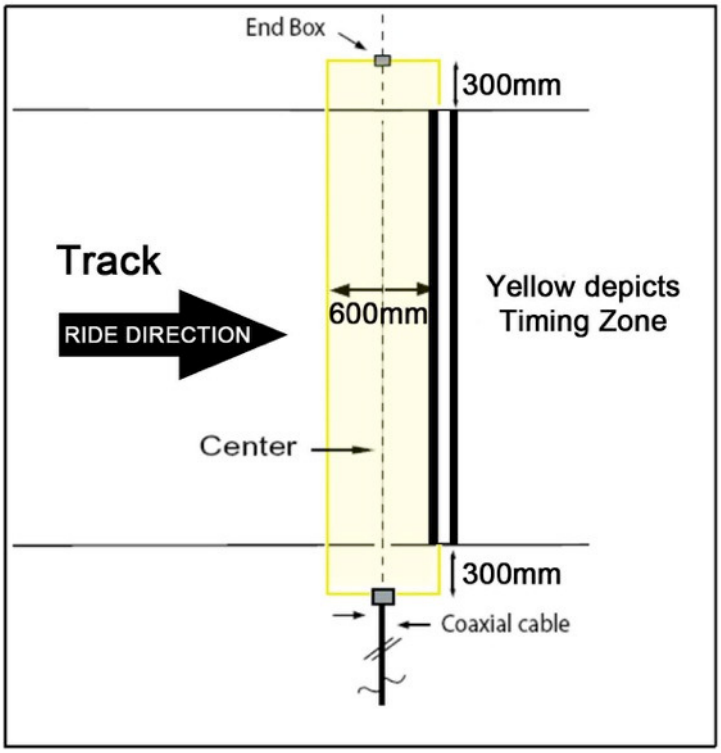
Detection loops

- Prochip detection loop 6m
- Prochip detection loop 9m
- Prochip detection loop 12m
- Prochip detection loop 16m

Most tracks will use a 12m loop at the Hill loop and 9m at the finish loop. But measure the track width at these points to determine which length loop will suit.

Start Pulse Cable

The start pulse cable is run from the Hill Decoder to the start controller. Any 2-wire insulated cable can be used. If purchasing cable any insulated cable with at least 2 wires is suitable, telephone cable or cat5e with twisted pairs is excellent. It can be buried or overhead cabled, however, it should be in conduit to protect it. This cable connects to the Grey starting (A) Interface box at the Progate control and runs to the (B) box being sited next to the Start Hill decoder.



Example of loop installation on a finish line

5 Example Installation

Using a concrete saw, two parallel lines are cuts into a start ramp. The loop is put into the cuts and silicone holds the loop in place. Loop terminates into an enclosure at the side of the ramp for the coaxial cable to go to decoder.

Trenching for conduit and coax runs from access pits to loop locations around the track.

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Trenching across track to reach corner exit.

Access pit – Collecting two loops then back to decoder using 3 x 25mm conduit

Access pit – Collecting 1 x 32mm, 2 x 25 with 40mm back to points hut/decoders. Total of 5 loops and 2 x Network

Enclosure beside the track for loop termination to coax.

6 Additional Detail

Considerations when installing:

- The detection loop wires have to be parallel with a 600mm distance between them.
- The end and connection boxes are to be located at the centre line of the loop allowing for 300mm on the outside of the track.
- The connection box and end box are located at the centre line of the detection loop.
- Avoid excess loop wires by matching the loop to track width.
- No bike areas at least 2m around detector loops
- At tracks where straights are very close together; there is the possibility of detecting transponders from the adjacent straight. Keep this in mind.
- If loop wires are cut to so there is no excess, they must be soldered and waterproofed.
- Ensure that no metallic items, electrical devices or wires are nearby the detection loop
- Coax runs should be as short as possible and preferably no more than 100m. There are options to have wireless communications – talk to us if you are unsure!
- THINK AHEAD - Perhaps run conduit and draw wires to where your club may want to install intermediate (training) loops later.
- A 'TUDS' box (access pit) is a great way to have multiple coax and network cables come into to then redistribute to bigger or smaller conduit.

Cable Specification

MyLaps Prochip Detection Loop
MyLaps Coax Connection to Loop
Matchmaster, Belden or equivalent RG6 Quad-shield Coaxial Cable
Hubbell, Dynamix or similar Cat5e or Cat6 Network Cable

Information and assistance regarding installation

BMXNZ – Darryll Ranford – darryll@bmxnz.co.nz – 021502554

MYLAPS equipment resellers

New Zealand Distributor – Element 82 – John Wightman - johnw@element82.co.nz - 021719191

Australian Distributor – Eventsoft – Martin Ward - martin@eventsoft.com.au - +61 414 818 450