Certificate IV in Electrical — Rail Signalling (UEE41220)

HRD
Integrated Services

HRD Integrated Services technical training

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Brief info

Course code: C4RS

Course cost
- PoA. Contact HRD for a quote.

Duration (approximate)
- Qualified electricians 2 years
- Apprentices 3½–4 years

Training delivery
- Mixed–mode learning in 5 day blocks, 4–6 weeks apart
- Min 6–max 8 persons per group
- Customised to enterprise demands

Assessment format
- In-class/workplace assignments and learning module theory tests
- Workplace practical assessments

Venue
- Rail Academy–Newport or interstate training venue

What to bring
- Laptop computer, notebook, pens
- Safety vest and boots

Outcome
- Nationally-recognised Qualification or Statement(s) of Attainment issued on demonstration of competence.

Prerequisites
- *Certificate III in Electrotechnology Electrician* (or equivalent) OR unrestricted electrical licence is mandatory.
- Conditions apply to electrical fitters – contact HRD for entry details.
- Intending applicants **must** be employed in rail signalling or with a rail infrastructure organisation to have access to essential workplace equipment and work procedures.

The HRD Certificate IV in Electrical–Rail Signalling course is the industry benchmark for rail signalling training and assessment.

Training

Quality training. Comprehensive training is delivered by technically skilled, qualified and experienced trainers.
HRD staff are experts in their field with national and international trade and training experience.

Realistic pace, safety first. HRD training is paced to maximise knowledge and skill development – no cramming or skimming content.
- Installers can exit after completing wiring, testing and repair units that provide the knowledge and skills needed for a rail construction role.
- Maintainers exit with job–ready technical knowledge and skills.

Contextualised content. Learning material is relevant to local standards. HRD can customise learning resources to meet specific business needs.

Assessment

Rigorous assessment. HRD assessment is a genuine measure of competence. Practical assessment ensures consistency across your business and confirms that industry standards are met.

HRD does not cut corners. Employers and industry can be confident that our assessment process ensures that employees are competent to carry out tasks in a safety–critical role.

RPL/RCC. Recognition of prior learning/current competence is available to eligible existing employees — confirms employee skills and helps meet regulatory demands for a qualified workforce.

Training options and advice
Not sure about what training your people require? Need advice about suitable training options and offerings?

Enquire with HRD about options and alternatives. We provide informed, accurate advice about the **BEST** option for your personnel and your business.

HRD's comprehensive Certificate IV program is *the* proven course that provides competent, work–ready signal maintainers to the industry workforce locally and nationally.

HRD Integrated Services Pty Ltd
Quality rail signalling training and assessment solutions
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Certificate IV qualification structure
This is the typical UEE41220 Certificate IV course HRD offers but can be customised to local needs.

Certificate IV Rail Signalling Core – Industry Specialisation Units

- UEERS0001 Assemble and wire internal electrical signalling equipment
- UEERS0011 Install and maintain rail track circuit leads and bonds
- UEERS0019 Test copper rail signalling cables
- UEERS0017 Repair rail signalling power and control cables

Industry foundation units (the 'Wiring Units') are prerequisites to the core technical units below and must be completed at the start of the Certificate IV course.

Certificate IV Rail Signalling core – general

- UEECD0024 Participate in development and follow a personal competency development plan
- UEECD0027 Implement and monitor energy sector WHS policies and procedures
- UEERE0015 Implement and monitor energy sector environmental and sustainable policies and procedures

Delivery and assessment of general core units is integrated into core technical and elective units.

Certificate IV Rail Signalling core – technical units

- UEERS0010 Install and maintain rail signalling power supplies
- UEERS0005 Install and maintain active level crossing equipment
- UEERS0009 Install and maintain power operated point-actuating devices
- UEERS0013 Install and maintain train detection equipment
- UEERS0012 Install and maintain trackside signal and train protection equipment
- UEERS0014 Install and maintain vital relay interlocking systems
- UEERS0004 Find and repair rail signalling system faults

Core units are mandatory and involve theory–based learning with practical application in both non-live environments and in the workplace.

UEERS0004 assessment is embedded in all core technical units.

Certificate IV Rail Signalling technical electives (recommended electives)

- UEERS0008 Install and maintain non-vital telemetry systems
- UEERS0006 Install and maintain computer–based interlocking rail systems

Elective options can be varied by negotiation and within qualification packaging rules.

Certificate IV Rail Signalling additional general electives

- UEECS0003 Assemble, set up and test computing devices
- UEECS0022 Install and configure a client computer operating system and software
- UEECS0029 Set up and configure basic local area network

OS and LAN electives are additional optional electives agreed by industry as useful to signal maintainers.

Installer skills

The Certificate III rail signal specialisation units prepare learners to exit training for work as a **SIGNAL INSTALLER**

There's a pathway allowing these skills to be added to later.

National recognition

Participants who successfully complete the UEE41220 Certificate IV course are qualified rail signal installer, maintainer or reactive technicians.

There's opportunity for interstate employment once local requirements are met.

Employers: HRD can help you top-up a new employee with knowledge and skills to meet local standards.

HRD–C4 Rail Signalling training

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UEE41220 Certificate IV in Electrical–Rail Signalling
HRD Learning module overview

The HRD Rail Signalling Certificate IV course is a comprehensive program of learning and assessment across the key disciplines of rail signalling.

The course provides an insight into the equipment types used in Australian rail networks. There is a detailed coverage of underpinning knowledge supported by a range of practical experiences to enhance theory learning.

HRD–RS0010 Railway signalling power supplies
(UEErs0010 Install and maintain rail signalling power supplies)

Railway signalling power supplies provides an understanding of the fundamental principles of power sources used in rail signalling systems. Content covers:

- AC/DC railway supplies
- low voltage, including battery systems
- HV supplies, awareness and principles
- alternative power supplies; for example, pneumatics, hydraulics, solar
- back-up systems such as UPS and generators.

HRD–RS0013–1 Jointed track circuits and bonding systems
(UEErs0013 Install and maintain train detection equipment)

Track circuit training consists of two modules: *Jointed Track Circuit and Bonding System* and *Jointless Track Circuit and Bonding System.*

The *Jointed track circuit and bonding system* training module provides participants with the knowledge and skills to plan, prepare and perform routine maintenance tasks and diagnose basic faults on:

- track circuit bonding
- DC track circuits
- Westrak track circuits

- AC single rail and double rail track circuits
- High Voltage Impulse track circuits
- DC Coded track circuits
- Microlok II DC Coded track circuits.

HRD–RS0012 Signals and train protection systems
(UEErs0012 Install and maintain trackside signal and train protection equipment)

Signals and train protection systems training introduces learners to signal mechanisms, trainstop mechanisms and the Train Protection Warning System as used in Victorian rail.

Learners gain the knowledge and skills to perform maintenance and to diagnose basic faults on:

- signal infrastructure and the associated complex control and indication circuits
- train stop mechanisms and the associated complex control and indication circuits
- train Protection Warning Systems (TPWS) and the associated complex control and indication circuits
- site specific and non-standard signal control circuits.

HRD–RS0009 Point mechanisms
(UEENrs0009 Install and maintain power operated point-actuating devices)

Point mechanism training consists of on-rail locking point mechanisms, off-rail point mechanisms, derailers and slips.

This training module provides learners with the knowledge and skills to perform maintenance and to diagnose basic faults on:

- signal infrastructure and the associated complex control and indication circuits
- the associated complex control and indication circuits
- special point control circuits.

HRD–RS0005 Level crossing protection systems
(UEErs0005 Install and maintain active level crossing equipment))

Level crossing protection training covers road crossing protection and pedestrian crossing protection.

Road crossing protection system training provides participants with the knowledge and skills to perform maintenance and to diagnose faults on:

- single line level crossing systems fitted with flashing lights
- double line level crossing systems fitted with boom barriers.

Pedestrian crossing system training provides the knowledge and skills to perform maintenance and to diagnose basic faults on:

- standalone pedestrian system controls
- pedestrian system controls integrated with a level crossing system.

HRD–RS0014 Relay and geographic interlocking systems
(UEE0014 Install and maintain vital relay interlocking systems)

An interlocking system permits a signaller to safely operate point and signal levers (via control panel selections) that permit the safe passage of a train through a signalled section. This training module provides learners with the knowledge and skills to install wiring and relays, maintain and diagnose basic faults on:

- relay interlocking circuits
- geographic interlocking circuits.

Training covers:

- failsafe relays used in interlocking circuits
- interlocking fundamentals, point control circuits and controlled signal circuits
- geographic interlocking module configurations and circuitry
- principles of geographic interlocking operation
- unit lever and VDU based control panels.

UEE41211 Certificate IV in Electrical–Rail Signalling
HRD Learning module overview

HRD–RS0013–2 Jointless track circuits and bonding systems

(UEERS0013 Install and maintain train detection equipment)

Jointless track circuit and bonding system training provides learners with the knowledge and skills to set-up, perform routine maintenance tasks and diagnose basic faults on:

- UM71 jointless track circuits
- FS2500 jointless track circuits
- AFO track circuits
- IPI track circuits
- axle counter track circuits.
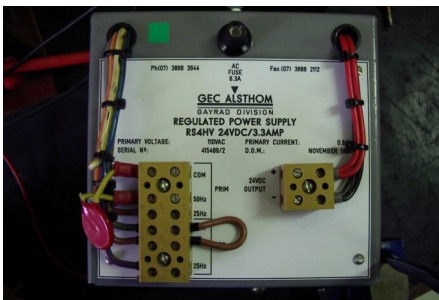
HRD–RS0006 Computer-based interlocking systems

(UEERS0006 Install and maintain computer based interlocking systems)

Computer-based interlocking training consists of various CBI systems from different manufacturers:

- SSI
- VHLC
- WESTRACE
- WESTLOK
- Microlok.

HRD–RS0004 Testing and commissioning

This training module provides participants with the knowledge and skills to test and certify rail signal systems circuits and equipment, excluding interlocking circuits.

HRD–RS0008 Telemetry systems

(UEERS0008 Install and maintain non-vital telemetry systems)

Telemetry systems training introduces trainees to the fundamentals of telemetry in a rail signal network and the different models of telemetry systems used in Victorian rail.

Learners gain the knowledge and skills to perform maintenance and to diagnose basic faults on:

- non-vital signal infrastructure and associated complex control and indication circuits
- telemetry control stations and associated complex control and indication modules
- telemetry field stations and associated complex control and indication modules.

HRD–CS-0003, CS0022 and CS0029 PC and LAN applications

As part of the Certificate IV learners also undertake modules covering:

- PC hardware, operating systems and software applications which allow them to perform computer maintenance and fault diagnosis
- setting up and configuring a local area network (LAN).

The HRD training and assessment model

Training

The HRD training model emphasises quality, responsiveness and flexibility, with content delivered by technically qualified and experienced trainers.

Training is typically delivered in 5 day blocks, 4–6 weeks apart. This allows a learner time to apply knowledge in the workplace prior to commencing of the next learning module. Some sessions may be delivered remotely via a videoconferencing platform. Knowledge and skill is built sequentially so that there's no cramming. And there's ample time for workplace mentoring.

Assessment

HRD's robust assessment practices have an eye to reliability, consistency and safety.

HRD uses a rigorous three stage assessment process for the UEE41211 qualification:

1. An assignment (including theory and practical components) is completed primarily in the workplace, with reference to local maintenance instructions and work procedures.
2. A written theory assessment identifies learning gaps and determines a learner's readiness to undertake the next training module.
3. Workplace practical assessment (WPA) is the final measure of competence.

Workplace practical assessment

Workplace assessment measures competence more than once.

WPA typically occurs on a unit-by-unit basis. It asks the candidate to perform work tasks competently by demonstrating knowledge and skills consistent with safety-critical requirements and using organisational maintenance instructions.

Assessment of the 'wiring units' can be undertaken at the conclusion of training for those modules. A learner exiting training at this point has the enabling knowledge and skills to work as an installer in rail construction.

Learners completing the full Certificate IV generally undertake a minimum of two WPA for each remaining unit of competency at the conclusion of the last training module.

A note about competence

A learner assessed as competent in a recognised VET program has met a minimum national standard.

However, competence doesn't mean that a graduate exiting training can work to the same level as an experienced employee. A recent training graduate needs mentoring and support to develop their experience.

RPL

Recognition of prior learning for the UEE41211 Certificate IV is available to eligible candidates who have currency of employment in signalling.

RPL assessment under the HRD model includes demonstration of essential skills to support documentary evidence. Practical demonstration of skills ensures that employers and industry can be confident that the person can really do the job, *safely*, *today*.

The HRD RPL process asks for quality, current evidence. Our view is that 'safety–critical' underpins the meaning of competence in the rail context.

Where a knowledge or skill gap is identified HRD may recommend additional on-job experience, gap training, or perhaps having to accept that the skill in question is not required for the job role.