



Information security manual

Guidelines for communications infrastructure

Last updated: September 2026

Cabling infrastructure

Context

This section applies only to facilities located within Australia. In doing so, it covers common security controls for both single-tenant and shared facilities, and specific security controls for only shared facilities, such as a single floor or part of a floor within a multi-tenanted building.

For the purposes of this section, a cable is defined as any fibre optic or copper material housed within a protective sheath for the purposes of transmitting data or control signals from one point in a facility to another. Each cable will form part of a structured cabling system and will need to comply with the Australian Standards associated with that system.

In addition to network communications and data systems, some common building management structured cabling systems found within facilities include:

- fire control and sensor systems
- security control and surveillance systems
- lighting control systems
- access control systems
- voice and emergency telephony systems
- emergency control alert systems.

Finally, protective sheaths for cables are not considered a conduit and the same cable connector types can be used for all systems within a facility regardless of their sensitivity or classification.

Cabling infrastructure standards

Cabling infrastructure should be installed by an endorsed cable installer to the relevant Australian Standards to ensure personnel safety and system availability.

Control: ISM-0181; Revision: 3; Updated: Mar-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cabling infrastructure is installed in accordance with relevant Australian Standards, as directed by the Australian Communications and Media Authority.

Use of fibre-optic cables

Fibre-optic cables do not produce electromagnetic emanations and are not influenced by them. As a result, they offer the highest degree of protection from electromagnetic emanation effects.

Control: ISM-1111; Revision: 3; Updated: Mar-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Fibre-optic cables are used for cabling infrastructure instead of copper cables.

Cable register

Developing, implementing, maintaining and regularly verifying cable registers assists installers and inspectors, with the help of floor plan diagrams, to trace cables for malicious or accidental changes or damage. In doing so, cable registers should track all cabling changes throughout the life of a system.

Control: ISM-0211; Revision: 8; Updated: Jun-26; Applicable: NC, OS, P, S, TS; Essential 8: N/A

A cable register is developed, implemented, maintained and regularly verified.

Control: ISM-0208; Revision: 6; Updated: Jun-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

A cable register contains the following for each cable:

- cable identifier
- cable colour
- sensitivity/classification
- source
- destination
- location
- seal numbers (if applicable).

Floor plan diagrams

Floor plan diagrams that are developed using computer-aided design and drafting applications, and use alphanumeric grid referencing, can provide an accurate scaled view for each floor and are critical to ensuring that cabling infrastructure components can be easily located by installers and inspectors. In doing so, floor plan diagrams should track all cabling infrastructure changes throughout the life of a system.

Control: ISM-1645; Revision: 3; Updated: Jun-26; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Floor plan diagrams are developed, implemented, maintained and regularly verified.

Control: ISM-1646; Revision: 0; Updated: Jun-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Floor plan diagrams contain the following:

- cable paths (including ingress and egress points between floors)
- cable reticulation system and conduit paths
- floor concentration boxes
- wall outlet boxes
- network cabinets.

Cable labelling processes and procedures

Well-documented cable labelling processes and procedures can make cable verification and fault finding easier.

Control: ISM-0206; Revision: 7; Updated: Dec-22; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cable labelling processes, and supporting cable labelling procedures, are developed, implemented and maintained.

Labelling cables

Labelling cables with the correct source and destination details minimises the likelihood of cross-patching and aids in fault finding and configuration management.

Control: ISM-1096; Revision: 2; Updated: Oct-19; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cables are labelled at each end with sufficient source and destination details to enable the physical identification and inspection of the cable.

Labelling building management cables

All facilities will contain structured cabling systems to support building management and control functions. As Australian Standards require some structured cabling systems to use specified colours, such as red for fire control systems, it is important that all building management cables are appropriately labelled.

Control: ISM-1639; Revision: 0; Updated: Mar-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Building management cables are labelled with their purpose in black writing on a yellow background, with a minimum size of 2.5 cm x 1 cm, and attached at five-metre intervals.

Labelling cables for foreign systems in Australian facilities

Labelling cables for foreign systems in Australian facilities helps prevent unintended cross-patching of Australian and foreign systems.

Control: ISM-1640; Revision: 0; Updated: Mar-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cables for foreign systems installed in Australian facilities are labelled at inspection points.

Cable colours

To avoid confusion, it is important that, regardless of the type of cabling involved, a consistent cable colour is used. Furthermore, the use of designated cable colours can provide an easy way to distinguish cables for SECRET and TOP SECRET systems from cables for other systems. For example, while SECRET and TOP SECRET cables have designated cable colours, cables for other systems may be any colour except for those reserved for SECRET and TOP SECRET systems. In addition, cable colours for other systems, such as non-classified, OFFICIAL: Sensitive and PROTECTED systems, may use the same colour, such as blue.

Control: ISM-1820; Revision: 0; Updated: Mar-23; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cables for individual systems use a consistent colour.

Control: ISM-0926; Revision: 11; Updated: Dec-24; Applicable: NC, OS, P; Essential 8: N/A

Non-classified, OFFICIAL: Sensitive and PROTECTED cables are coloured neither salmon pink nor red.

Control: ISM-1718; Revision: 1; Updated: Mar-23; Applicable: S; Essential 8: N/A

SECRET cables are coloured salmon pink.

Control: ISM-1719; Revision: 1; Updated: Mar-23; Applicable: TS; Essential 8: N/A

TOP SECRET cables are coloured red.

Cable colour non-conformance

In certain circumstances, it may not be possible to use the correct colour for SECRET or TOP SECRET cables. In such cases, an organisation should band such cables with the appropriate colour and ensure that the cable bands are easily visible at inspection points. In doing so, it is important that cable bands are robust enough to stand the test of time. Examples of appropriate cable bands include stick-on coloured labels, colour heat shrink, coloured ferrules or short lengths of banded conduit.

Control: ISM-1216; Revision: 4; Updated: Jun-24; Applicable: S, TS; Essential 8: N/A

SECRET and TOP SECRET cables with non-conformant cable colouring are banded with the appropriate colour and labelled at inspection points.

Cable inspectability

The ability to inspect cabling infrastructure is necessary to detect illicit tampering or degradation. This does not mean that cables need to be fully visible all the time. Rather, cable inspectability can be achieved if cables can be viewed and inspected through the easy removal of ceiling, floor or wall panels or manholes.

Control: ISM-1112; Revision: 4; Updated: Dec-24; Applicable: NC, OS, P, S; Essential 8: N/A

Cables in non-TOP SECRET areas are inspectable every five metres or less.

Control: ISM-1119; Revision: 2; Updated: Dec-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cables in TOP SECRET areas are fully inspectable for their entire length.

Common cable bundles and conduits

In some circumstances, cables for different systems can be bundled together or run in a common conduit to reduce costs, such as cables for OFFICIAL: Sensitive and PROTECTED systems.

Control: ISM-0187; Revision: 8; Updated: Mar-23; Applicable: S; Essential 8: N/A

SECRET cables, when bundled together or run in conduit, are run exclusively in their own individual cable bundle or conduit.

Control: ISM-1821; Revision: 0; Updated: Mar-23; Applicable: TS; Essential 8: N/A

TOP SECRET cables, when bundled together or run in conduit, are run exclusively in their own individual cable bundle or conduit.

Common cable reticulation systems

When cable reticulation systems are used for more than one cable bundle or conduit, it is important that there is a dividing partition or visible gap between cable bundles and conduits to facilitate easier cable inspection.

Control: ISM-1114; Revision: 4; Updated: Mar-23; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cable bundles or conduits sharing a common cable reticulation system have a dividing partition or visible gap between each cable bundle and conduit.

Enclosed cable reticulation systems

In shared facilities, cables should be enclosed in a sealed cable reticulation system to prevent access and enhance cable management.

Control: ISM-1130; Revision: 4; Updated: Dec-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

In shared facilities, cables are run in an enclosed cable reticulation system.

Covers for enclosed cable reticulation systems

In shared facilities, clear covers on enclosed cable reticulation systems are a convenient method of maintaining inspection requirements. Having clear covers that face inwards increases their inspectability.

Control: ISM-1164; Revision: 3; Updated: Dec-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

In shared facilities, conduits or the front covers of ducts, cable trays in floors and ceilings, and associated fittings are clear plastic.

Sealing cable reticulation systems and conduits

In shared facilities, uniquely identifiable Security Construction and Equipment Committee (SCEC)-approved tamper-evident seals should be used to provide evidence of any tampering or illicit access to TOP SECRET cable reticulation systems. In addition, TOP SECRET conduits should be sealed with a visible smear of conduit glue to prevent access.

Control: ISM-0195; Revision: 7; Updated: Jun-22; Applicable: TS; Essential 8: N/A

In shared facilities, uniquely identifiable SCEC-approved tamper-evident seals are used to seal all removable covers on TOP SECRET cable reticulation systems.

Control: ISM-0194; Revision: 3; Updated: Dec-21; Applicable: TS; Essential 8: N/A

In shared facilities, a visible smear of conduit glue is used to seal all plastic conduit joints and TOP SECRET conduits connected by threaded lock nuts.

Labelling conduits

Labels for TOP SECRET conduits should be of sufficient size and colour to enable easy identification.

Control: ISM-0201; Revision: 3; Updated: Mar-21; Applicable: TS; Essential 8: N/A

Labels for TOP SECRET conduits are a minimum size of 2.5 cm x 1 cm, attached at five-metre intervals and marked as 'TS RUN'.

Cables in walls

Cables run correctly in walls enable neater installations while maintaining separation and inspection requirements.

Control: ISM-1115; Revision: 4; Updated: Dec-19; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cables from cable trays to wall outlet boxes are run in flexible or plastic conduit.

Cables in party walls

In shared facilities, TOP SECRET cables are not run in party walls. However, an inner wall can be used to run TOP SECRET cables where sufficient space exists for their inspection.

Control: ISM-1133; Revision: 3; Updated: Dec-21; Applicable: TS; Essential 8: N/A

In shared facilities, TOP SECRET cables are not run in party walls.

Wall penetrations

Penetrating a wall between a TOP SECRET area and a lower classified area requires the integrity of the TOP SECRET area to be maintained. In such scenarios, TOP SECRET cables should be encased in conduit with all gaps between the TOP SECRET conduit and the wall filled with an appropriate sealing compound.

Control: ISM-1122; Revision: 2; Updated: Dec-21; Applicable: TS; Essential 8: N/A

Where wall penetrations exit a TOP SECRET area into a lower classified area, TOP SECRET cables are encased in conduit with all gaps between the TOP SECRET conduit and the wall filled with an appropriate sealing compound.

Wall outlet boxes

Wall outlet boxes are the main method of connecting cabling infrastructure to workstations. They enable the management of cables and the types of connectors allocated to various systems.

Control: ISM-1105; Revision: 4; Updated: Mar-23; Applicable: S, TS; Essential 8: N/A

SECRET and TOP SECRET wall outlet boxes contain exclusively SECRET or TOP SECRET cables.

Labelling wall outlet boxes

Clear labelling of wall outlet boxes diminishes the possibility of incorrectly attaching information technology (IT) equipment to the wrong wall outlet box. In cases where a wall outlet box contains cables for different systems, each connector should be individually labelled.

Control: ISM-1095; Revision: 5; Updated: Dec-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Wall outlet boxes denote the systems, cable identifiers and wall outlet box identifier.

Wall outlet box colours

The use of designated wall outlet box colours can provide an easy way to distinguish wall outlet boxes for SECRET and TOP SECRET systems from wall outlet boxes for other systems. For example, while SECRET and TOP SECRET wall outlet boxes have designated wall outlet box colours, wall outlet boxes for other systems may be any colour except for those reserved for SECRET and TOP SECRET systems. In addition, wall outlet box colours for other systems, such as non-classified, OFFICIAL: Sensitive and PROTECTED systems, may use the same colour, such as blue. Ideally, wall outlet boxes should be the same colour that is used for associated cabling.

Control: ISM-1822; Revision: 0; Updated: Mar-23; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Wall outlet boxes for individual systems use a consistent colour.

Control: ISM-1107; Revision: 7; Updated: Dec-24; Applicable: NC, OS, P; Essential 8: N/A

Non-classified, OFFICIAL: Sensitive and PROTECTED wall outlet boxes are coloured neither salmon pink nor red.

Control: ISM-1720; Revision: 0; Updated: Dec-21; Applicable: S; Essential 8: N/A

SECRET wall outlet boxes are coloured salmon pink.

Control: ISM-1721; Revision: 0; Updated: Dec-21; Applicable: TS; Essential 8: N/A

TOP SECRET wall outlet boxes are coloured red.

Wall outlet box covers

Transparent wall outlet box covers enable the identification of cable cross-patching and signs of tampering.

Control: ISM-1109; Revision: 3; Updated: Dec-19; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Wall outlet box covers are clear plastic.

Fly lead installation

Keeping the lengths of TOP SECRET fibre-optic fly leads to a minimum prevents clutter around desks, prevents damage, and reduces the chance of cross-patching and tampering. If lengths become excessive, TOP SECRET fibre-optic fly leads should be treated as cabling infrastructure and run in TOP SECRET conduit or fixed infrastructure, such as desk partitioning.

Control: ISM-0218; Revision: 7; Updated: Jun-24; Applicable: TS; Essential 8: N/A

If TOP SECRET fibre-optic fly leads exceeding five metres in length are used to connect wall outlet boxes to IT equipment, they are run in a protective and easily inspected pathway that is clearly labelled at the IT equipment end with the wall outlet box's identifier.

Connecting cable reticulation systems to cabinets

Controlling the routing from cable reticulation systems to cabinets can assist in preventing unauthorised modifications and tampering while also providing easy inspection of cables.

Control: ISM-1102; Revision: 3; Updated: Dec-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

Cable reticulation systems leading into cabinets are terminated as close as possible to the cabinet.

Control: ISM-1101; Revision: 3; Updated: Dec-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

In TOP SECRET areas, cable reticulation systems leading into cabinets in server rooms or communications rooms are terminated as close as possible to the cabinet.

Control: ISM-1103; Revision: 3; Updated: Dec-21; Applicable: NC, OS, P, S, TS; Essential 8: N/A

In TOP SECRET areas, cable reticulation systems leading into cabinets not in server rooms or communications rooms are terminated at the boundary of the cabinet.

Terminating cables in cabinets

Having individual or divided cabinets can assist in preventing accidental or deliberate cross-patching and makes inspection of cables easier.

Control: ISM-1098; Revision: 5; Updated: Mar-23; Applicable: S; Essential 8: N/A

SECRET cables are terminated in an individual cabinet; or for small systems, a cabinet with a division plate between any SECRET cables and non-SECRET cables.

Control: ISM-1100; Revision: 1; Updated: Sep-18; Applicable: TS; Essential 8: N/A

TOP SECRET cables are terminated in an individual TOP SECRET cabinet.

Terminating cables on patch panels

Terminating SECRET and TOP SECRET cables on different patch panels in cabinets can assist in preventing accidental or deliberate cross-patching and makes inspection of cables easier.

Control: ISM-0213; Revision: 4; Updated: Mar-23; Applicable: S, TS; Essential 8: N/A

SECRET and TOP SECRET cables are terminated on their own individual patch panels.

Physical separation of cabinets and patch panels

Physical separation between TOP SECRET systems and non-TOP SECRET systems reduces the chance of cross-patching. This reduces the possibility of unauthorised personnel gaining access to TOP SECRET systems.

Control: ISM-0216; Revision: 3; Updated: Mar-23; Applicable: TS; Essential 8: N/A

TOP SECRET patch panels are installed in individual TOP SECRET cabinets.

Control: ISM-0217; Revision: 5; Updated: Mar-23; Applicable: TS; Essential 8: N/A

Where spatial constraints demand non-TOP SECRET patch panels be installed in the same cabinet as a TOP SECRET patch panel:

- *a physical barrier in the cabinet is provided to separate patch panels*
- *only personnel holding a Positive Vetting security clearance have access to the cabinet*
- *approval from the TOP SECRET system's authorising officer is obtained prior to installation.*

Control: ISM-1116; Revision: 4; Updated: Mar-23; Applicable: TS; Essential 8: N/A

A visible gap exists between TOP SECRET cabinets and non-TOP SECRET cabinets.

Audio secure rooms

Audio secure rooms are designed to prevent audio conversations from being overheard. The Australian Security Intelligence Organisation should be consulted before any modifications are made to TOP SECRET audio secure rooms.

Control: ISM-0198; Revision: 3; Updated: Dec-21; Applicable: TS; Essential 8: N/A

When penetrating a TOP SECRET audio secure room, the Australian Security Intelligence Organisation is consulted and all directions provided are complied with.

Power reticulation

It is important that TOP SECRET systems have control over the power system to prevent denial of service by deliberate or accidental means.

Control: ISM-1123; Revision: 4; Updated: Jun-24; Applicable: TS; Essential 8: N/A

A power distribution board with a feed from an Uninterruptible Power Supply is used to power all TOP SECRET IT equipment.

Further information

[Australian cabling standards](#) can be obtained from the Australian Communications and Media Authority.

Further information on SCEC-approved tamper-evident seals can be found on the SCEC's [Security Equipment Evaluated Products List](#).

Further information on audio secure rooms can be found in the Department of Home Affairs' [Protective Security Policy Framework](#).

Emanation security

Electromagnetic interference/electromagnetic compatibility standards

All IT equipment used by systems will need to meet industry and government standards relating to electromagnetic interference/electromagnetic compatibility.

Control: ISM-0250; Revision: 5; Updated: Jun-24; Applicable: NC, OS, P, S, TS; Essential 8: N/A
IT equipment meets industry and government standards relating to electromagnetic interference/electromagnetic compatibility.

Emanation security doctrine

The Australian Signals Directorate (ASD) specifies emanation security requirements in its *Emanation security manual* and Australian Communications Security Instructions that must be complied with. Such requirements supplement these guidelines and, where conflicts occur, take precedence.

Control: ISM-1884; Revision: 0; Updated: Dec-23; Applicable: OS, P, S, TS; Essential 8: N/A
Emanation security doctrine produced by ASD for the management of emanation security matters is complied with.

Emanation security risk assessments

Obtaining advice from ASD on emanation security risks is vital to protecting SECRET and TOP SECRET systems, inside and outside of Australian borders. This can assist in preventing SECRET and TOP SECRET systems from emanating compromising signals, which if intercepted and analysed, could lead to serious consequences. The implementation of such advice is in addition to, and not a replacement for, industry and government standards relating to electromagnetic interference/electromagnetic compatibility.

In conducting emanation security risk assessments, it is important that they are sought by system owners as early as possible in a system's life cycle as development timeframes and costs will be much greater if changes need to be made to systems once they have been designed and implemented.

On completion of emanation security risk assessments, system owners will receive emanation security mitigation advice that contains recommended actions to be taken to reduce emanation security risks. In doing so, any recommendations not implemented by system owners will need to be accepted by a system's authorising officer.

Control: ISM-1137; Revision: 6; Updated: Mar-26; Applicable: S, TS; Essential 8: N/A
System owners deploying SECRET or TOP SECRET systems within fixed facilities contact ASD for an emanation security risk assessment.

Control: ISM-0249; Revision: 7; Updated: Mar-26; Applicable: S, TS; Essential 8: N/A
System owners deploying SECRET or TOP SECRET systems in mobile platforms, or as a deployable capability, contact ASD for an emanation security risk assessment.

Control: ISM-0246; Revision: 7; Updated: Mar-26; Applicable: S, TS; Essential 8: N/A

When an emanation security risk assessment is required, it is sought as early as possible in a system's life cycle.

Control: ISM-1885; Revision: 2; Updated: Mar-26; Applicable: S, TS; Essential 8: N/A

Recommended actions contained within emanation security mitigation advice issued for systems are implemented by system owners.

Disclaimer

The material in this guide is of a general nature and should not be regarded as legal advice or relied on for assistance in any particular circumstance or emergency situation. In any important matter, you should seek appropriate independent professional advice in relation to your own circumstances.

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