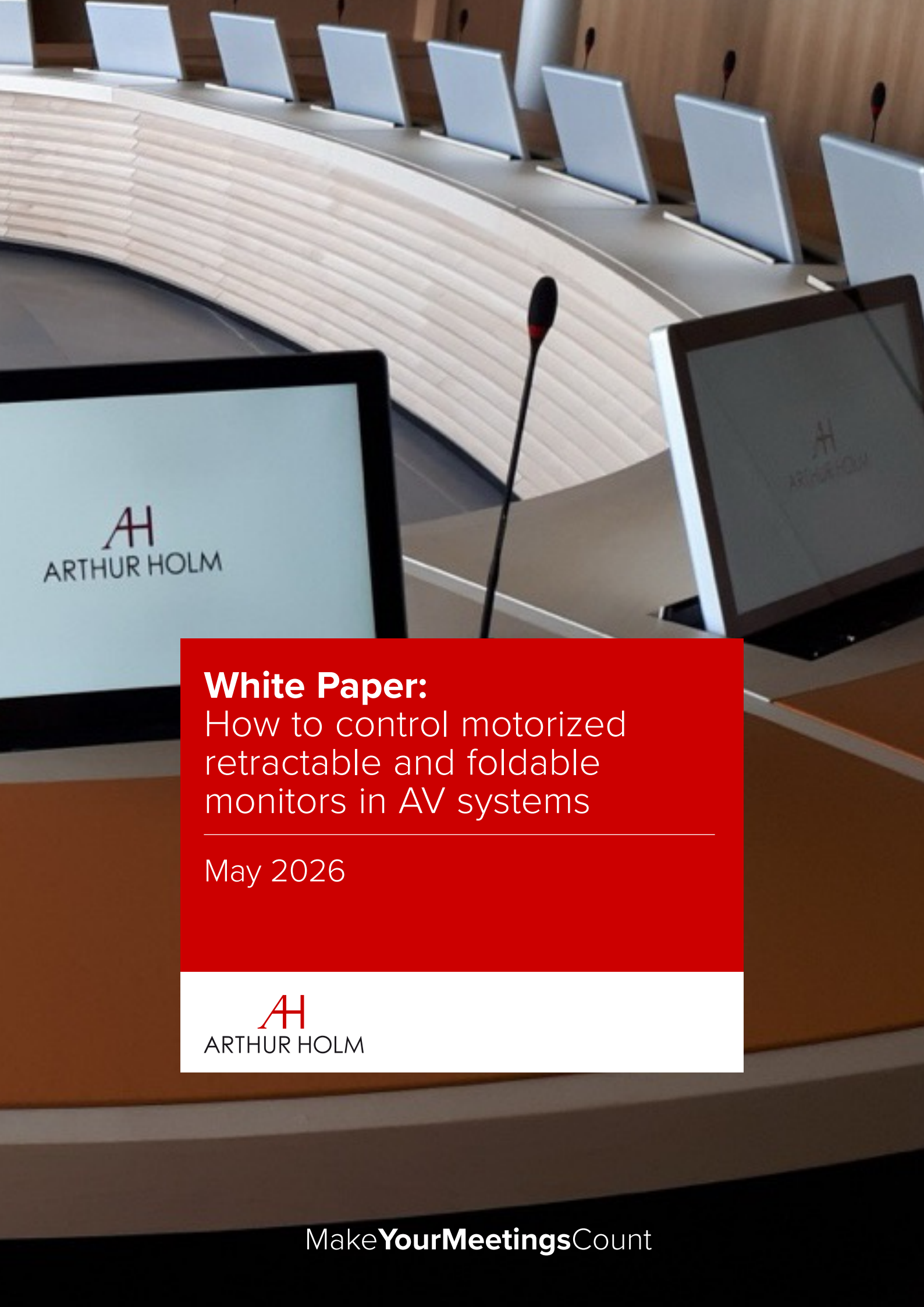

White Paper:
How to control motorized retractable and foldable monitors in AV systems

May 2026

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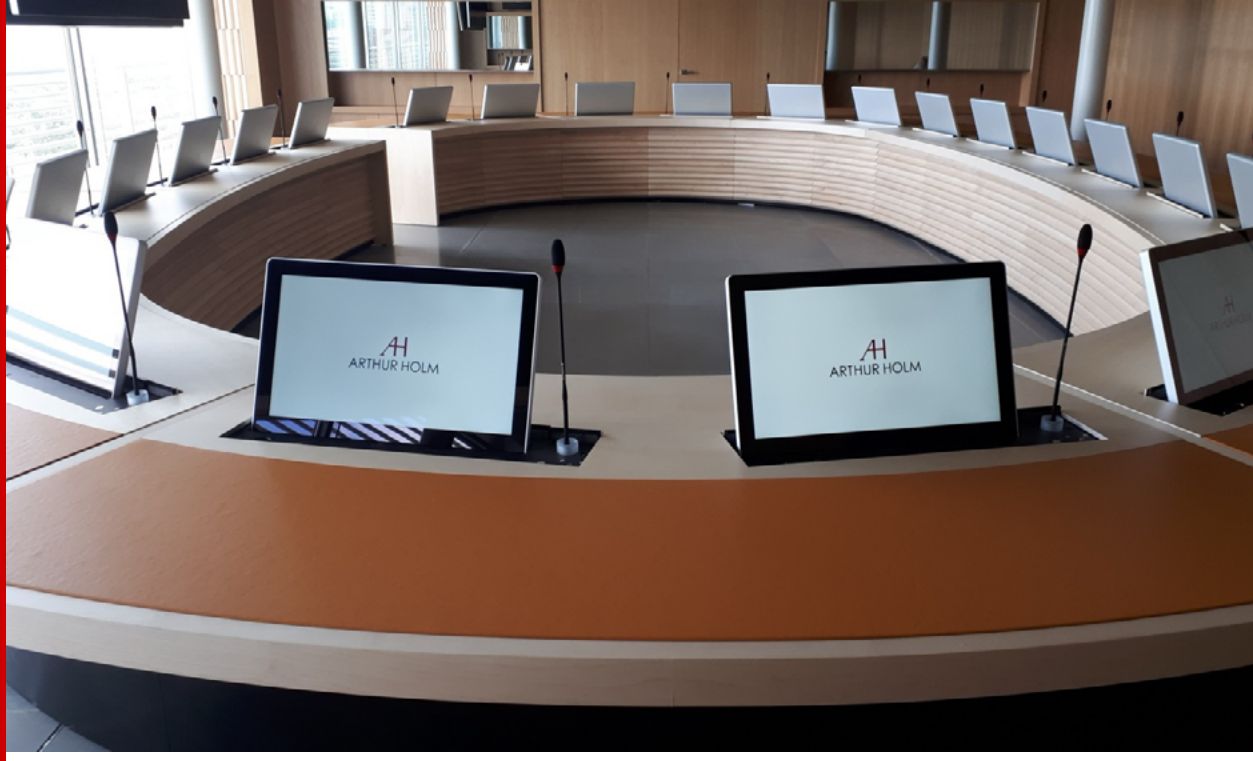

How to control motorized retractable and foldable monitors in AV systems

Arthur Holm solutions are specified in corporate headquarters, government institutions and high-end architectural projects worldwide. This white paper reflects direct technical experience in professional AV control integration across major control platforms.

A retractable motorized monitor that rises and lowers on command from a room control system is not the same thing as a retractable monitor that a user operates manually. The difference is not merely one of convenience — it is architectural. When monitors are integrated into a room control system, they become part of a coordinated environment: they rise when a meeting starts, retract when it ends, respond to room scenes, synchronize with lighting and audio, and can be monitored and diagnosed remotely without physical access to the table.

Getting that integration right requires a clear understanding of the control architecture that Arthur Holm systems use, how to commission it correctly, and how to avoid the most common mistakes that create problems after handover.

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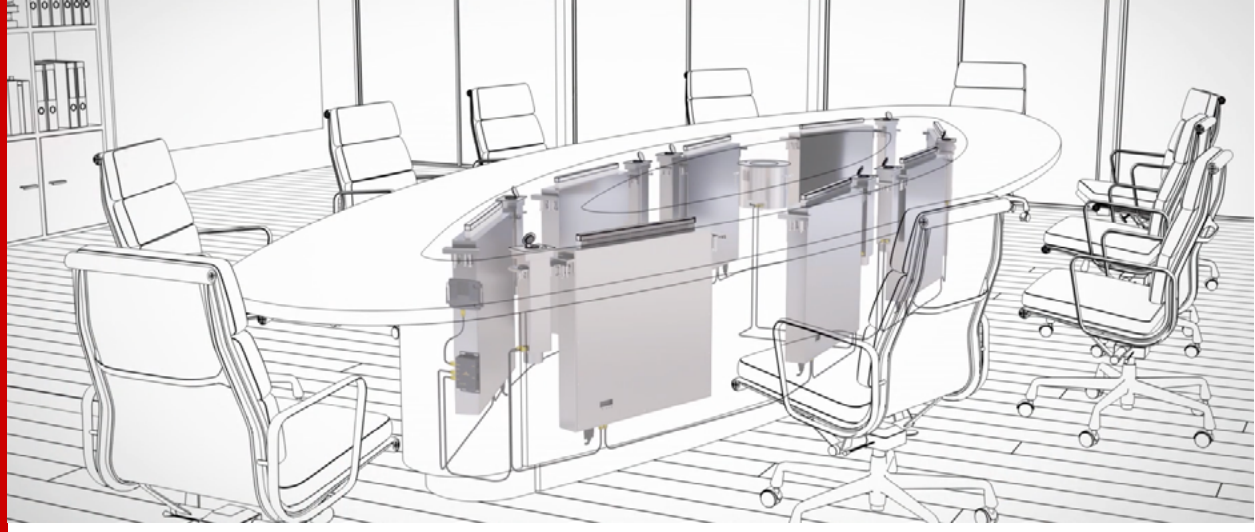

The AHnet control architecture

All Arthur Holm motorized monitors and other motorized products communicate via AHnet —this protocol is based on RS-422/RS-485 Full Duplex serial protocol that forms the control backbone of every professional Arthur Holm installation. Understanding AHnet is the starting point for any control system integration. From now on we will refer to this protocol as AHnet.

What RS-422/RS-485 Full Duplex means in practice

RS-422/RS-485 Full Duplex is a balanced serial communication standard designed for reliable data transmission over long cable runs in electrically noisy environments — exactly the conditions found inside furniture and under boardroom and conference tables. Unlike RS-232, RS-422/RS-485 Full Duplex supports multi-drop bus topologies, offering noise immunity, long distance performance and no loss.

Arthur Holm implements RS-422/RS-485 Full Duplex via RJ45 connectors with a loop-through architecture: each monitor has an AHnet IN and an AHnet OUT port. Monitors are connected in a daisy-chain topology, so a single line run from the ERT interface passes through every monitor on the bus. This significantly simplifies cabling compared to point-to-point wiring architectures.

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- Maximum devices per RS-422/RS-485 Full Duplex bus: 30 (ERT-30) or 60 (ERT-60, using two buses of 30)
- Maximum cable length between bus ends: 500m / 1,640ft
- Cable type: shielded (FTP) RJ45 CAT6
- Bus termination switch: activate only on the last unit of the bus

Individual addressing — OTAS

Every monitor on the bus must have a unique address. Arthur Holm's OTAS (One Touch Addressing System), implemented through the ERT interface, automates this process: with DIP2 activated on the ERT, the interface sends addressing commands to all connected units automatically, assigning sequential addresses without requiring the integrator to access each monitor individually. This is one of the most significant time-savers during commissioning on multi-monitor installations.

Addresses must start at 1 and must be unique on each bus. Duplicate addresses are the most common commissioning error in Arthur Holm installations and the first thing to check when a monitor is not responding to control commands.

In combined products such as DynamicX2Talk, D3Talk, or DB3Talk, the system exposes only one AHnet port, but internally the product contains multiple addressable subsystems (for example, the monitor mechanism and the DynamicTalk microphone lift). Each subsystem responds to a different command set under the same AHnet address, allowing the controller to distinguish between "monitor commands" and "internal commands".

This means that even though the product occupies one physical AHnet node, the integrator can still perform independent control of the monitor's movement and, for example, the microphone's lift through separate command groups defined in the AHnet protocol.

The ERT interface: the hub of the control system

In most professional Arthur Holm installations, the ERT is the recommended central interface between the AV control system and the AHnet bus. It bridges the room's AV control system to the RS-422/ RS-485 Full Duplex monitor bus, and provides IP-based access for commissioning, diagnostics and remote management. By acting as the single gateway to the AHnet bus, the ERT ensures stable communication, simplifies integration, and centralises all monitoring and configuration tasks.

ERT MODELS

Model	RS-422/ RS-485 Full Duplex ports	Max devices	Key features
ERT-30	1 (AHnet1)	30	OTAS, IP control, AHlink, RDM (remote diagnosic and maintenance), single bus
ERT-60	2 (AHnet1 + AHnet2)	60	OTAS, IP control, AHlink, RDM (remote diagnostic and maintenance), dual bus

Both models include Ethernet (RJ45), USB service port for firmware upgrade, and integrated AHlink wireless control via the RF module.

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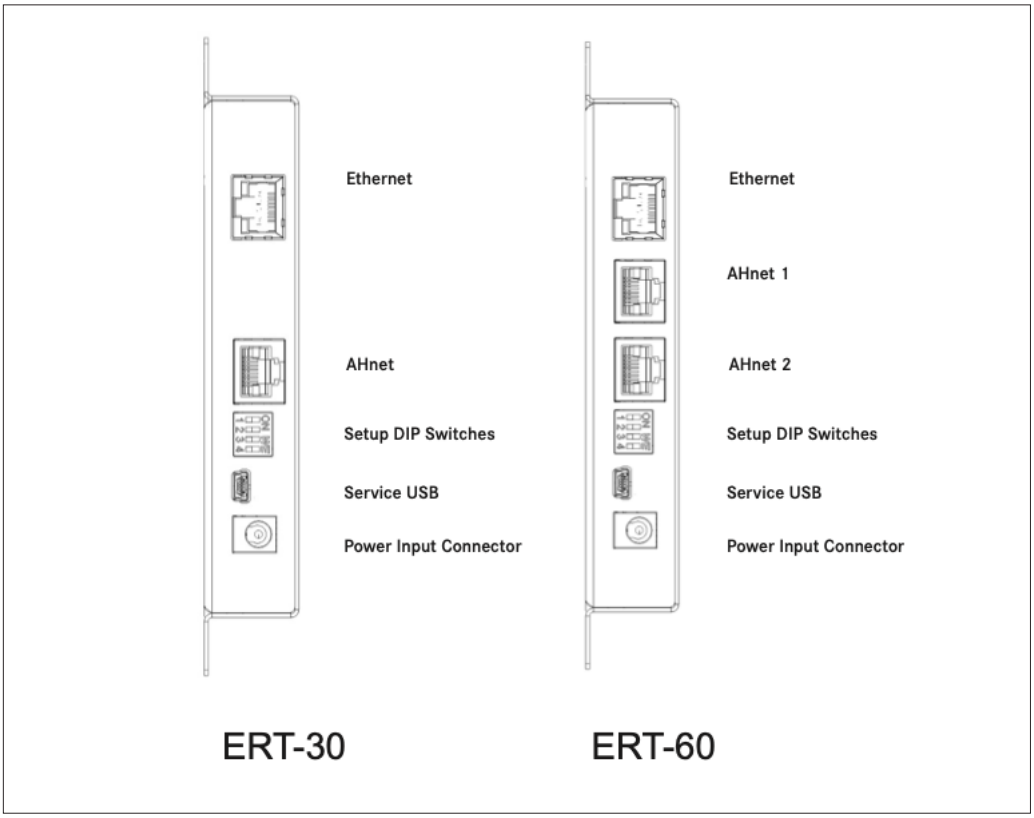

IP control via the ERT

The ERT opens TCP port 2002 on the local network, allowing any AV control system with IP communication capability to send AHnet commands directly to the monitors without going through the serial port. This is the preferred integration method for Q-Sys, Crestron, AMX, Extron, Kramer and other IP-capable control processors, as it simplifies the physical wiring between the AV rack and the table — a single network cable to the ERT, rather than a dedicated serial cable from the control processor.

The ERT's default factory IP address is 192.168.0.128. Reconfiguration is handled via the AHlink app after activating the RF module with DIP1 on the ERT. Static or DHCP IP configurations are available.

RDM — Remote Diagnostic and Maintenance

The ERT's RDM system provides remote visibility into the operational status of every monitor on the bus: movement logs, obstruction events, firmware version, address configuration and sensor status. This allows the integrator or Arthur Holm's support team to diagnose issues remotely — via IP — without physical access to the table. For large installations with distributed monitors across a building, RDM eliminates most on-site diagnostic visits.

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Control methods: from simple to integrated

Arthur Holm monitors support four distinct control methods, which can coexist in the same installation. The specifier must define which methods will be active and how they interact before commissioning begins.

1. Local touch sensor

The simplest control method: a capacitive touch sensor or button integrated into the cover plate or monitor housing. One touch raises the monitor, one touch lowers it. No external control system required, no addressing needed. Used in standalone installations or as a fallback control method in integrated systems.

2. GPI — General Purpose Input

Each Arthur Holm monitor includes a GPI port (SubD9 female) for contact-closure control. A dry contact closure between the appropriate pins raises or lowers the monitor. GPI is used for simple external triggering — a push button on the table edge, a room booking system output, or a third-party control device that does not support RS-422/RS-485 Full Duplex or IP. It is also used as a fallback control path in integrated installations.

Some Arthur Holm models also provide a GPO (General Purpose Output) which delivers a dry contact closure output that, for example, respond to free buttons status. This allows the unit to act as a trigger source for external equipment. It can be used to activate devices such as third-party automation modules, lighting cues, microphone logic inputs or any system that needs to react automatically. Because the GPO follows the free buttons state, it provides a reliable way to synchronize external actions with the physical behaviour of the unit.

3. RS-422/RS-485 Full Duplex via AHnet

Direct serial control from a control processor to the system, which relays commands to the monitors on the bus. Each monitor is addressed individually, allowing the control system to:

- Raise or lower individual monitors
- Raise or lower all monitors simultaneously (broadcast command)

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- Adjust brightness, contrast and backlight remotely
- Query monitor status and position
- Block the operation buttons or sensors
- Configure speed parameters and protection settings

The AHnet protocol is an open protocol — Arthur Holm publishes the command set, and control system programmers can develop native integration in Crestron, AMX, Q-Sys, Extron, Kramer or other programming environments without requiring a proprietary SDK or licensing agreement.

4. IP via ERT (TCP port 2002)

The same AHnet command set transmitted over IP rather than serial. The control processor opens a TCP connection to the ERT on port 2002 and sends AHnet commands as the payload. This is functionally equivalent to RS-422/RS-485 Full Duplex control but eliminates the serial cable run from the AV rack to the ERT, which can be significant in large rooms or multi-room installations. This allows the remote assistance of the Arthur Holm team for support (customersupport@arthurholm.com).

Commissioning workflow for AV integrators

The following sequence reflects best practice for commissioning an Arthur Holm installation integrated with a room AV control system. Deviating from this sequence — particularly steps 2 and 3 — is the most common source of post-handover issues.

Step 1 — Physical installation verification Confirm all monitors are physically installed, power is connected, and AHnet daisy-chain cabling is complete. Verify bus termination is active only on the last unit. Use shielded FTP RJ45 cable throughout.

Step 2 — Address configuration via OTAS Activate DIP2 on the ERT and power the unit. The ERT automatically assigns sequential addresses to all connected monitors. Verify address assignment via AHlink app before proceeding.

Step 3 — AH-AMMC mechanical calibration If monitors have been veneered or have cover plates fitted, run the AH-AMMC auto-calibration on each unit to adjust motor force parameters for the additional weight. This is done via AHlink or via the ISD display on the monitor. Do not skip this step on veneered installations — incorrect force parameters cause obstruction false triggers or mechanism damage over time.

Step 4 — ERT network configuration Connect the ERT to the room network. Configure IP address, mask and gateway via AHlink app. Verify TCP port 2002 is reachable from the control processor.

Step 5 — Control system driver integration Load or write the Arthur Holm driver on the control processor. Test individual monitor raise/lower commands. Test broadcast commands. Test status feedback. Verify ISD display reads correctly on each monitor via RS-422/RS-485 Full Duplex remote query.

Step 6 — Room scene programming Program the monitor raise/lower actions into the room's control scenes: meeting start, presentation mode, meeting end, standby. Coordinate monitor movement timing with lighting, audio and display system actions to avoid simultaneous mechanical movements that create noise or visual distraction.

Step 7 — AHlink final verification Use AHlink to review each monitor's serial number, firmware version, movement sensor status and address. Document the configuration for the handover record.

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Common integration mistakes and how to avoid them

Duplicate addresses on the bus Symptom: one monitor does not respond, or two monitors respond simultaneously to a single command. Solution: run OTAS again from scratch or modify the address manually via AHlink or ISD, then verify address assignment via AHlink before connecting to the control system.

Bus termination on wrong unit Symptom: intermittent communication errors, monitors dropping off the bus under load. Solution: termination must be active only on the last unit. Check TERM OUT LED on each monitor — it should be lit only on the final unit in the chain.

Unshielded cable in noisy environments Symptom: random communication errors, particularly when other equipment is powered on. Solution: replace with shielded CAT 6 FTP RJ45 cable throughout the RS-422/RS-485 Full Duplex bus. Arthur Holm technical documentation explicitly requires FTP cable.

AH-AMMC not run after veneering Symptom: obstruction sensor triggers during normal movement, or motor force insufficient to lift veneered cover. Solution: run AH-AMMC on every veneered unit after the veneer is applied and before the table is delivered to the client.

Control processor sending commands before monitors complete travel Symptom: monitors stop mid-travel, or rise/lower commands are ignored. Solution: add minimum travel time delays between sequential commands in the control system programme. Arthur Holm's travel time per unit varies by product and speed setting — measure actual travel time during commissioning and add a 10% buffer.

Delay between commands Symptom: intermittent communication errors, monitors dropping off the bus under load. Solution: Delay between each command send on the bus should not go under 50 ms. For simultaneous movements use broadcast commands.

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AHlink app: the integrator's field tool

The AHlink app (iOS and Android, free) is the primary commissioning and diagnostic tool for Arthur Holm installations. It connects wirelessly to the ERT or directly to individual monitors, and provides:

- Automatic detection of available devices
- Serial number and firmware version read-out
- Address configuration and verification
- Speed and protection parameter adjustment
- Movement sensor status monitoring
- AHnet command log — shows commands sent and received in real time, essential for diagnosing control system communication issues
- IP address configuration for the ERT
- AH-AMMC calibration trigger
- Microphone length adjustment and LED colour configuration (DynamicTalk)

The AHlink app is available for iOS and Android and is used for commissioning, configuration and diagnostics throughout the installation and service lifecycle.

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Frequently asked questions

Does Arthur Holm publish the AHnet protocol command set?
Yes. AHnet is an open protocol. The full command set is included in each product's technical documentation and in the ERT user guide, both available from Arthur Holm on request. Control system programmers can write native drivers without requiring a proprietary SDK or licensing agreement.

Can Crestron, Q-Sys, Extron, Kramer, or AMX control Arthur Holm monitors directly without the ERT? Technically, a control processor with an RS-422/RS-485 Full Duplex port can connect directly to the monitor bus. However, Arthur Holm's recommended and supported architecture is to use the ERT as the interface between the control system and the monitor bus. The ERT provides OTAS, RDM, IP access and AHlink integration that are not available with a direct connection. For IP-based control systems, the ERT is the recommended connection method.

What happens to the monitors if the control system loses power or communication? Monitors retain their last commanded position. They do not move autonomously. Local touch sensor control remains available as a fallback regardless of control system status, provided power to the monitors is maintained.

Can monitors on different tables in the same room be controlled from a single ERT? Yes, provided the total number of monitors does not exceed the ERT's capacity (30 for ERT-30, 60 for ERT-60) and the cable run between the ERT and the furthest monitor does not exceed 500m. In rooms with multiple tables, the daisy-chain topology allows the bus to pass from one table to another with standard RJ45 cabling.

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How are room scenes typically programmed for Arthur Holm monitors? Room scenes are programmed in the control system (Crestron, Q-Sys,AMX, Extron, Kramer) using AHnet commands sent via IP to the ERT or via serial to the RS-422/RS-485 Full Duplex bus. A typical meeting start scene sends a broadcast raise command to all monitors on the bus, then triggers the room's lighting, audio and display system actions in a defined sequence. A meeting end scene sends a broadcast lower command and resets the room to standby. More complex scenes — raising only presenter monitors, lowering specific seats — use individual address commands.

Is there a maximum number of ERT interfaces that can be used in a single building installation? No fixed maximum. Each ERT is an independent IP device on the network and is addressed by IP from the building's AV control system. Large installations — multi-room buildings, parliamentary buildings, government institutions — use one ERT per room or zone, each managed from a central control system or building management platform.

Integrating Arthur Holm monitors into a professional AV control system? Arthur Holm's technical team provides full integration support — protocol documentation, driver guidance and direct engineering consultation for complex control architectures.

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