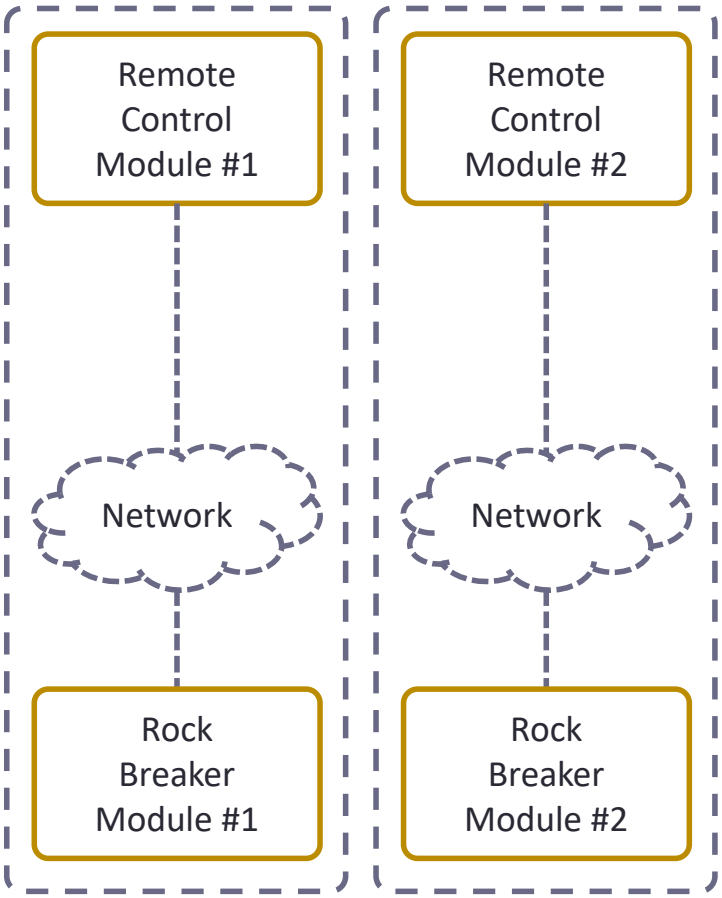
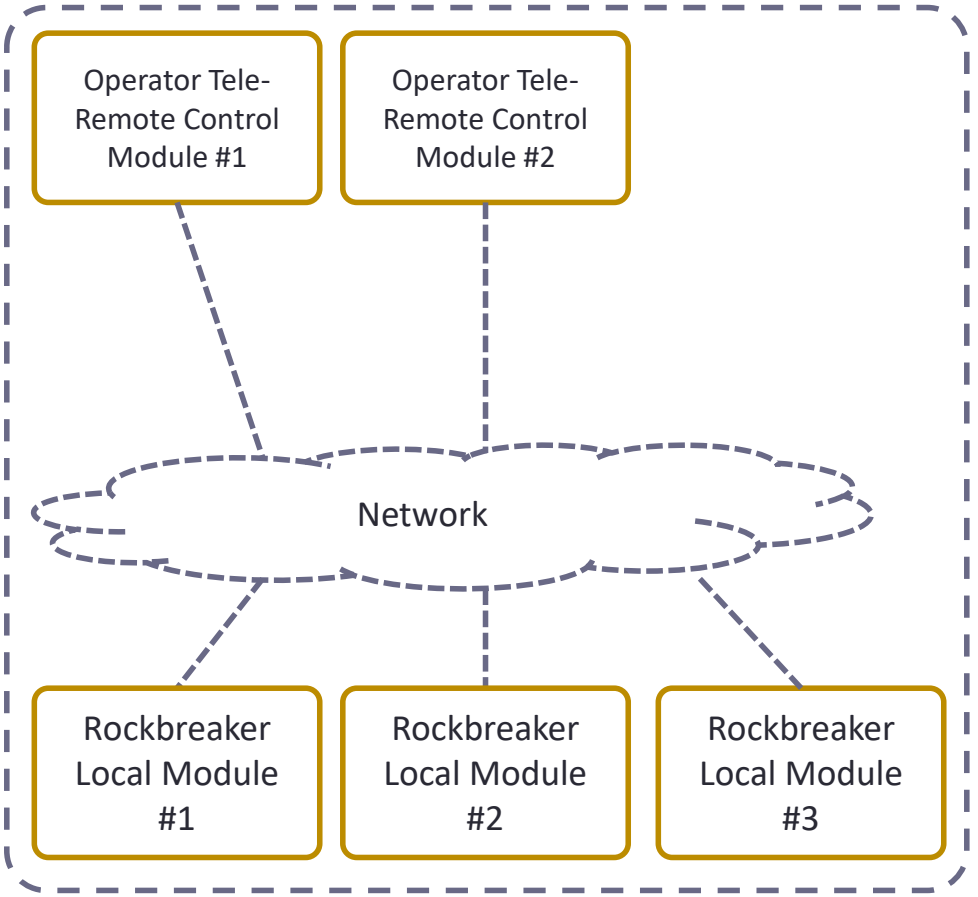
MULTI BOOM TELE-REMOTE LONG DISTANCE CONTROL

Single Boom



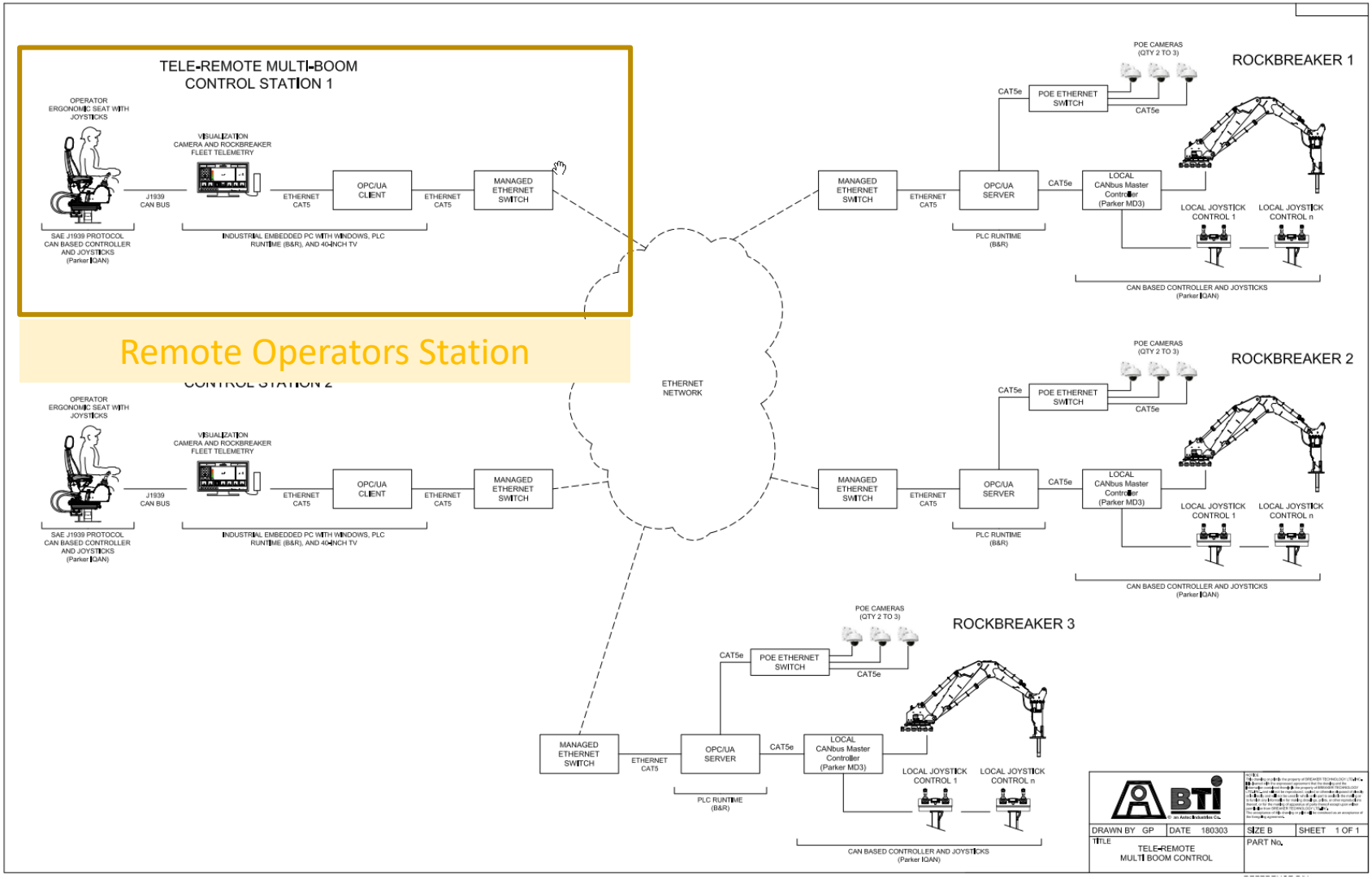
Multi-Boom



Items	Multi-Tele-Remote Long Distance Control
• HMI (Human machine interface)	• Advanced HMI display using 40-inch LED monitor displays two camera video, and rockbreaker telemetry. This is a modern HTML based HMI.
• Remote Joystick Control	• Advanced ergonomics. All operations are done from the joysticks. Operator interfacing with the HMI (40-inch monitor) is done completely from the joysticks. The joysticks will operate the rockbreaker, the cameras PTZ functions, and the mouse-cursor on the screen for selections.
• Operator Login Security	✓
• Communication protocols	• Ethernet/IP • J1939 • Communication on Ethernet LAN using OPC/UA protocol. The OPC server at the rockbreaker is a hardened off-highway mobile controller for robustness
• Maximum number of operator stations and rockbreakers	• Unlimited operator stations • Unlimited number of rockbreakers • The rockbreaker can only be monitored by up to sixteen remote operator stations simultaneously at any given time.
• Scalable remote control platform. Operator stations and rockbreakers can be removed and added without programming changes. Each remote and local modules are exact copies with only small software configuration differences	✓

Items	Multi-Tele-Remote Long Distance Control
• Joystick control functions and camera streams are completely integrated. When the operator selects a rockbreaker, both the joystick control and camera stream automatically switch. This prevents operator error. • Camera status monitoring and interlocks. If a camera error occurs the joysticks control are disabled	✓
• While operating a rockbreaker an operator can simultaneously monitor the status and availability of a group of rockbreakers.	✓
• Realtime monitoring and diagnostics: Fault logs, Machine statistics, monitor all Inputs/Outputs, configurable.	✓
• Long distance utilizing fiber optics	✓
• Technology upgrade ready	• Park and deploy (automated movements). • Collison avoidance (Perimeter Control). • Velocity control (function soft stops using inclinometers.

MULTI-BOOM TELE-REMOTE



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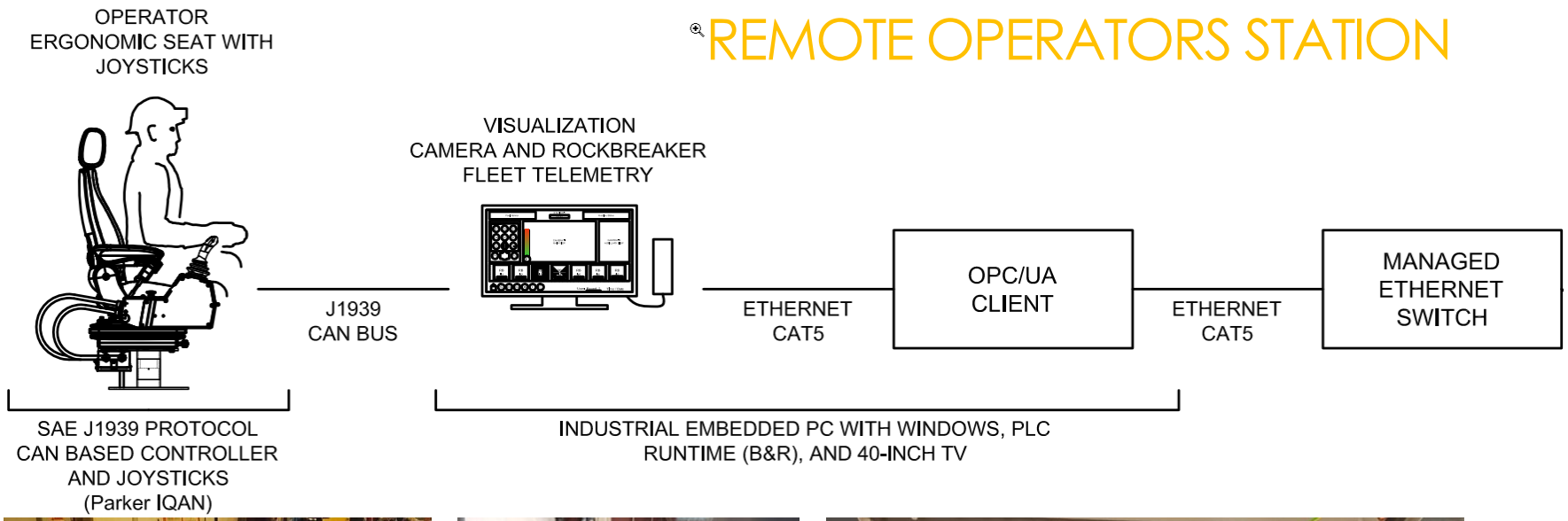
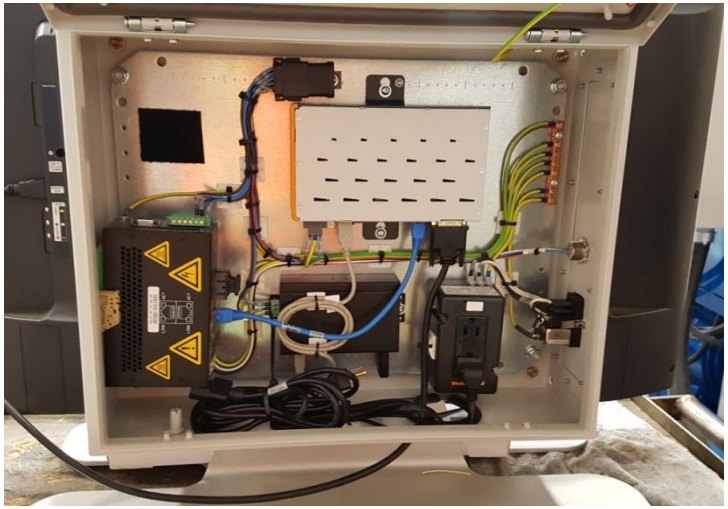
MULTI-BOOM TELE-REMOTE

REMOTE OPERATORS STATION





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MULTI-BOOM TELE-REMOTE OPERATORS STATION

- Multi-boom tele-remote control station, capable of remotely controlling a fleet of rockbreakers. Each rockbreaker must be equipped with the multi-boom tele-remote local control module. Provides remote control, monitoring, diagnostics, video and audio. The operator can simultaneously monitor the status and availability of a rockbreaker fleet. Facilitates quick rockbreaker selections; the operator can jump between many rockbreaker, allowing him to operate several rockbreakers with little switching delays.
- Located at customer master control center.
- Data transmission via Ethernet TCP utilizing end user's network.

Includes - Operator Controls:

- Ergonomic swivel seat with built-in joysticks. All operator machine interfacing is done via the joysticks, including; rockbreaker movement control, camera pan/tilt/zoom (PTZ) control, and screen cursor control.
- Emergency stop, fire suppression activation switch.
- 10 meter long cable (Mini 7/8") from seat to the visualization station.

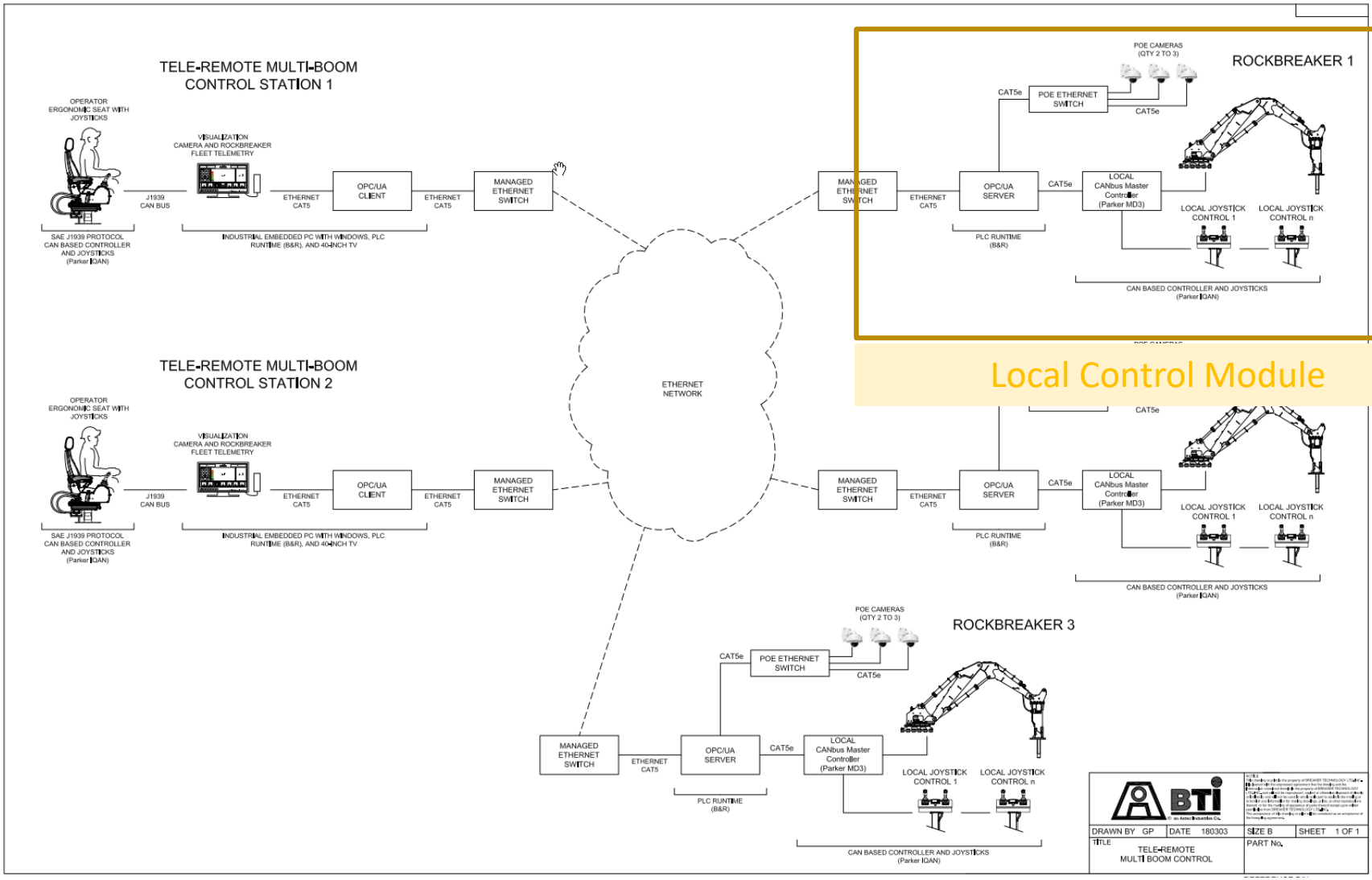
Includes - Visualization Station:

- 40-inch Wide Screen LED monitor for viewing two camera video streams, and rockbreaker telemetry
- TV and control panel stand, keyboard, mouse, 120/240Vac input cable 2.3 meters long (IEC 60320C13), On/off switch, and circuit protection.
- Embedded industrial PC (quad core) with Windows, PLC runtime, and OPC/UA client.
- MOXA Industrial Ethernet router. Two SFP Fiber ports (1000Mbps), and Eight 10/100BaseTX RJ45 Ports. Suitable for harsh environments. Supplied with 1 SFP to LC module which support point to point distance of 10km over single mode glass (9/125µm) fiber optic cable. Consult with regional sales manager for other options.
- This station is to be mounted on customer supplied desk.

Options

- **Ethernet Router**
  - Multi-mode with 1 SFP Duplex module with LC connectors. Supports point to point distance of 2km
  - Single-mode with 1 SFP Duplex module with LC connectors. Supports point to point distance of 10km, 30km, 80km, or 120km.

MULTI-BOOM TELE-REMOTE



Local Control Module

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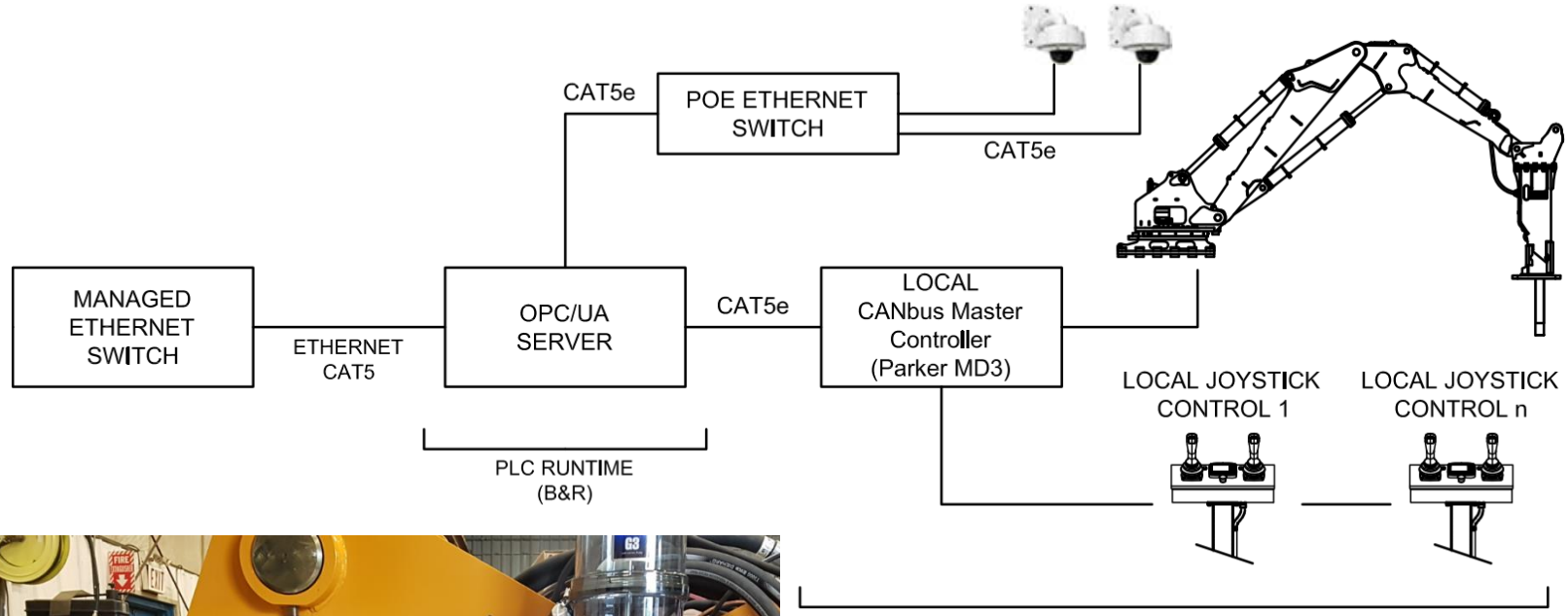
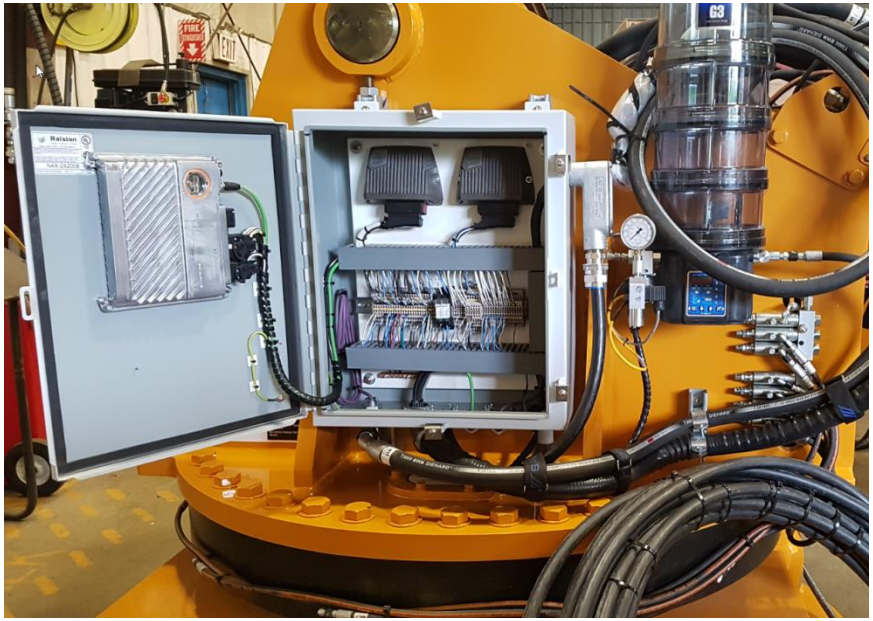
MULTI-BOOM TELE-REMOTE
LOCAL CONTROL MODULE





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MULTI-BOOM TELE-REMOTE LOCAL CONTROL MODULE

- This is an upgrade to the existing Electronic CANbus based programmable control system for the addition of Multi-Boom Tele-Remote capabilities.
- PLC with OPC/UA server, Emergency Safety-Relay, Horn, Strobe, Audio module and mic.
- Industrial Ethernet router. Two SFP Fiber ports (1000Mbps), and Eight 10/100BaseTX RJ45 Ports suitable for harsh environments. Supplied with SFP to LC module which support point to point distance of 30km over single mode glass (9/125µm) fiber optic cable. Consult with regional sales manager for other options. Camera system with low latency for remote control application.

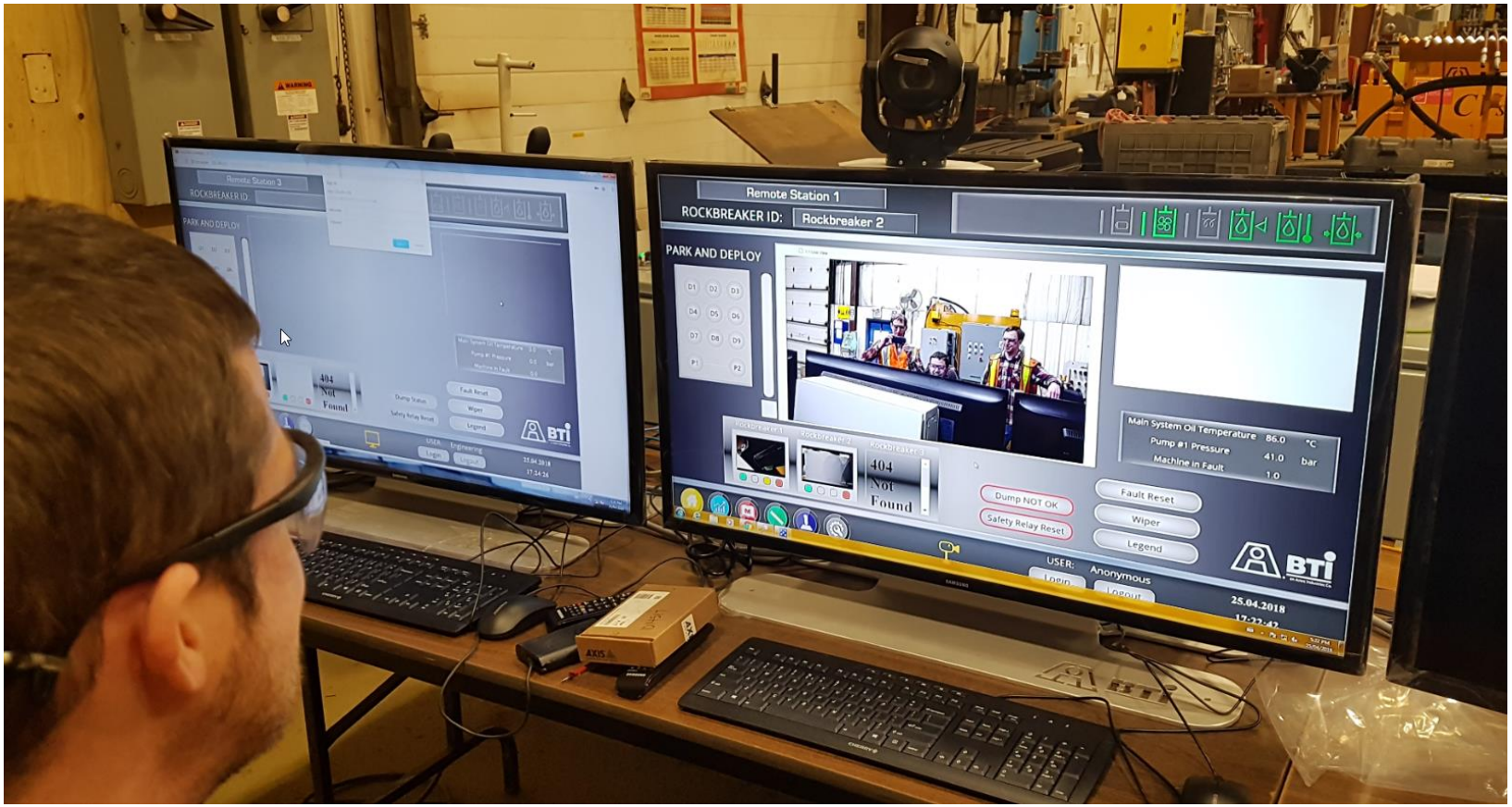
Includes - Standard Camera System

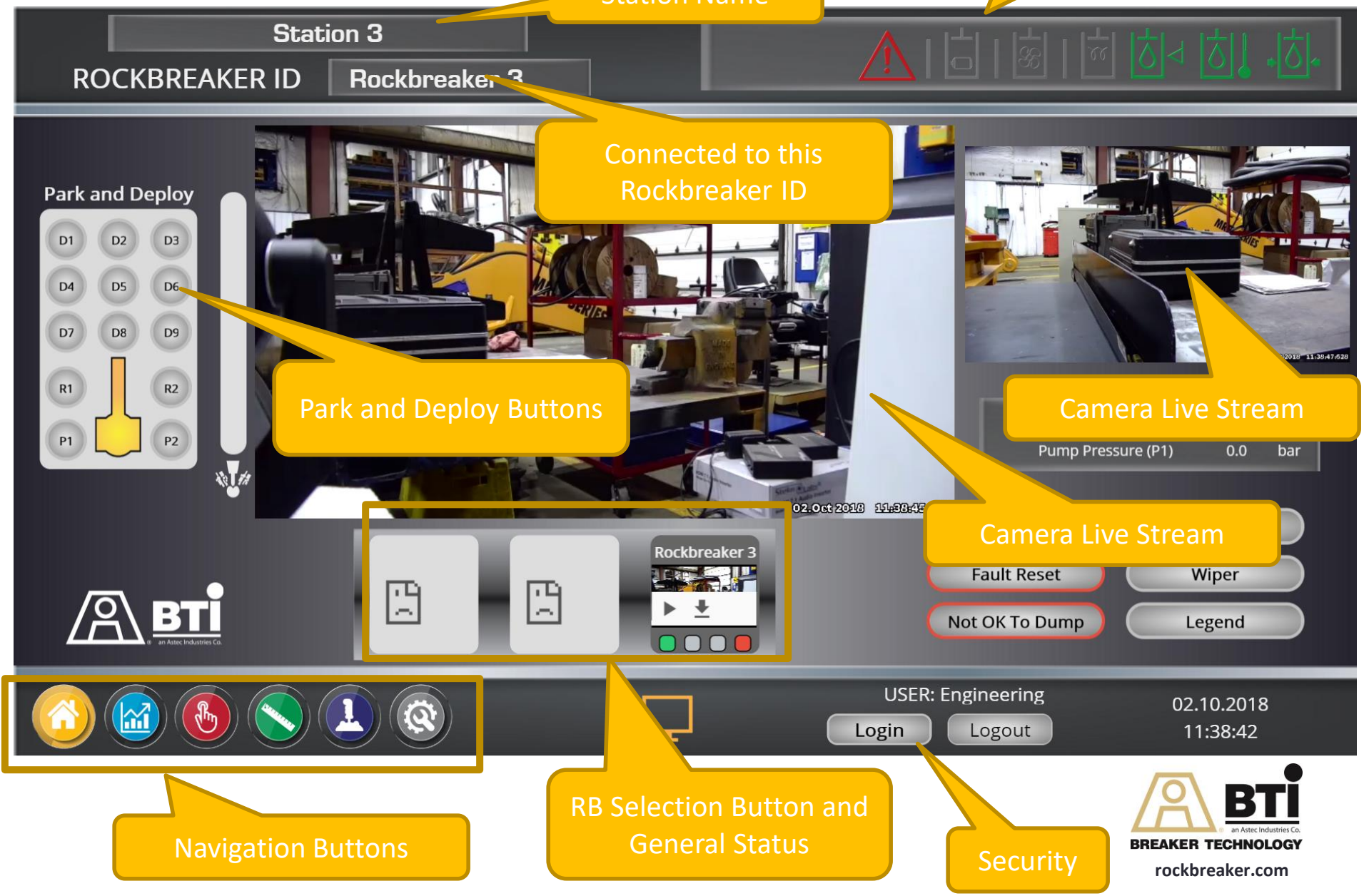
- Two Ethernet IP cameras; color, auto focus, auto iris, true PTZ (pan tilt zoom), outdoor rated, manufacturer Axis (P5624-E MKII). 23x optical zoom, 2.9° to 57° field of view. Polycarbonate clear dome.
- Control panel c/w PoE Ethernet Switch dedicated for cameras only.
- Mounting brackets, Ethernet cables (60 meters) and connectors.
- Installation guide provided.
- Installation not included. Done by others.

Multi-Boom Tele-remote - BOSCH Camera Upgrade (optional)

- Camera upgrade from Axis P5624-E MKII to Bosch MIC-7502. Two Ethernet IP cameras; color, auto focus, auto iris, true PTZ (pan tilt zoom), outdoor rated, manufacturer Bosch (MIC-7502). 30x optical zoom, 2.3° to 65° field of view. Exceptional strength and ruggedness for any outdoor application. Integrated wiper, and tempered flat glass.
- Our 'standard' PTZ camera, AXIS (P5624-E MKII) dome style, is robust and outdoor rated. However, being a dome style camera it does not incorporate a wiper, and may be susceptible to accumulate dust in extreme dusty environments. Also camera is only rated to -30°C . We can offer an upgraded camera which incorporates an integrated wiper, as well as rated to -40°C; this is the Bosch (MIC-7502).This wiper runs without water, and is effective at removing dust and water. Additionally, this Bosch camera has a tempered flat glass, in place of the polycarbonate clear dome on the AXIS camera, which is less susceptible to scratches.

MULTI-BOOM TELE-REMOTE




Machine Status Bar
Station Name
Station 3
ROCKBREAKER ID
Rockbreaker 3
Connected to this Rockbreaker ID
Park and Deploy
D1
D2
D3
D4
D5
D6
D7
D8
D9
R1
R2
P1
P2
Park and Deploy Buttons
Camera Live Stream
Pump Pressure (P1) 0.0 bar
Camera Live Stream
Rockbreaker 3
Fault Reset
Wiper
Not OK To Dump
Legend
BTI
USER: Engineering
Login
Logout
02.10.2018
11:38:42
Navigation Buttons
RB Selection Button and General Status
Security
BTI
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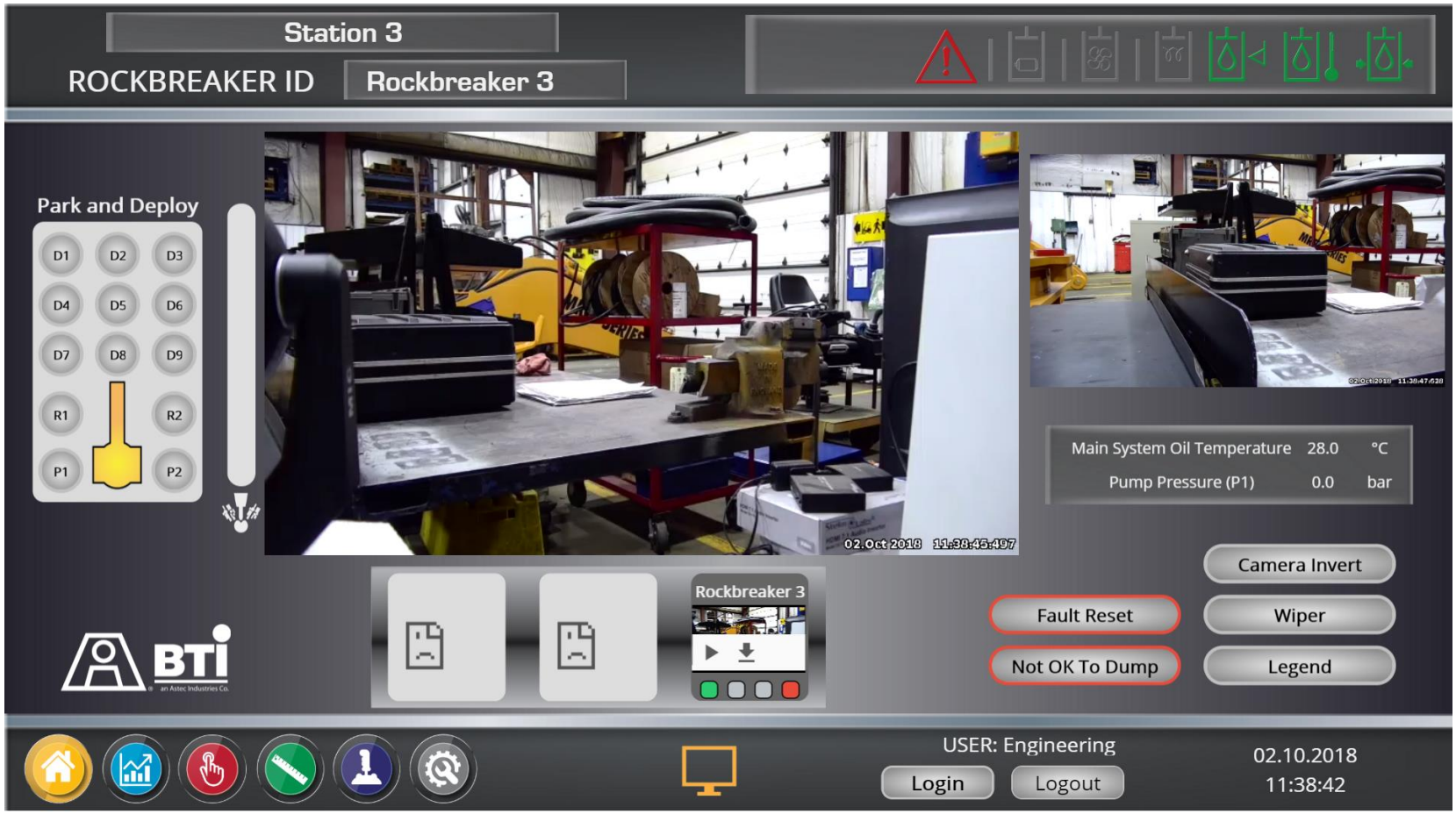
Visualization hmidisplay
controlstation3:81/index.html?visuID=HMIDisplay
Station 3
ROCKBREAKER ID
BREAKERINTEL
BY BTI BREAKER TECHNOLOGY
BREAKERINTEL
BY BTI BREAKER TECHNOLOGY
Main System Oil Temperature 0.0 °C
Pump Pressure (P1) 0.0 bar
Rockbreaker 3
Camera Invert
Fault Reset
Wiper
Dump Status
Legend
BTI
an Astec Industries Co.
USER: Anonymous
Login
Logout
02.10.2018
11:34:05
11:34 AM
02/10/2018


Station 3
ROCKBREAKER ID
Rockbreaker 3
Park and Deploy
D1
D2
D3
D4
D5
D6
D7
D8
D9
R1
R2
P1
P2
02.Oct 2018 11:38:45:407
Main System Oil Temperature 28.0 °C
Pump Pressure (P1) 0.0 bar
Rockbreaker 3
Camera Invert
Fault Reset
Wiper
Not OK To Dump
Legend
USER: Engineering
Login
Logout
02.10.2018
11:38:42

Station 3
ROCKBREAKER ID
Rockbreaker 3
STATISTICS
MACHINE INFO
Model MRSTE22/BXR65ED
SerialNumber 2018012
Project ID BTI_Master_V1.00.00.00
Author BTI-ENG
Date 180701
MACHINE HOURS
Electric Motor Run (Hrs) 4.0
Boom Moving (Hrs) 4.0
Breaker Activated (Hrs) 0.0
Low Boom Lube (Hrs) 13.0
Low Breaker Lube (Hrs) 11.0
Cooler Motor Run (Hrs) 1.0
MACHINE FAULTS
Alarm ID
Message
Time
46
FAULT #46. SWING SENSOR NOT CALIBRATED. Must be re-calibrated. Go to Boom Position screen to calibrate.
Tuesday, October 02, 2018 11:19:46 AM
38
FAULT #38. LIMP MODE WARNING. Speed Control and Soft Stops NOT WORKING. Running at inching speed. Select F4 to Bypass inching speed. Bypass will permit faster movement. Calibrated sensors for high speed.
Tuesday, October 02, 2018 11:19:46 AM
49
FAULT #49. SR1 SAFETY RELAY TRIPPED.Check relay and wiring. Wire #'s 10B & 47. Dry Contacts closed for Trip. Cycle power to reset fault.
Tuesday, October 02, 2018 11:09:10 AM
FAULT #46. SWING SENSOR NOT CALIBRATED. Must be re-
Tuesday, October
USER: Engineering
Login
Logout
02.10.2018
11:41:29

Station 3

ROCKBREAKER ID Rockbreaker 3

MEASURE

Rockbreaker Status

	Value		Value	Unit
Power ON	1.0	Main System Oil Temperature	28.0	°C
Pump Motor Running	0.0	Pump Pressure (P1)	0.0	bar
Cooler Motor Running	0.0	Boom Hoist Up Pressure	0.0	bar
Immersion Heater ON	0.0	Boom Hoist Down Pressure	0.0	bar
Boom Moving	0.0			
Breaker Fire Activated	0.0			
Local Joystick Selected	0.0			
Remote Joystick Selected	1.0			
Radio Joystick Selected	0.0			

Remote Commands | Valve Outputs

USER: Engineering

Login | Logout

02.10.2018
11:42:27

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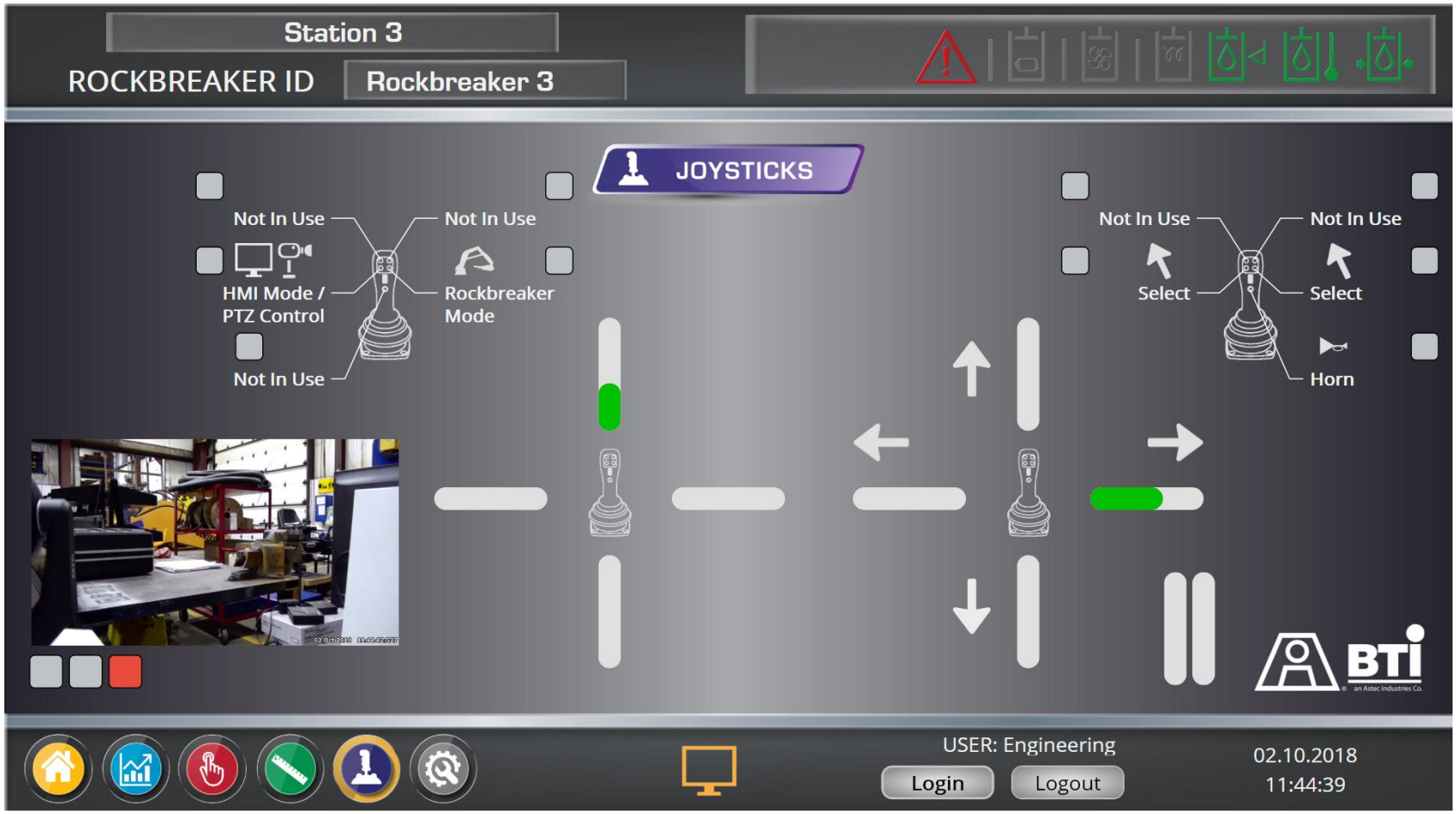
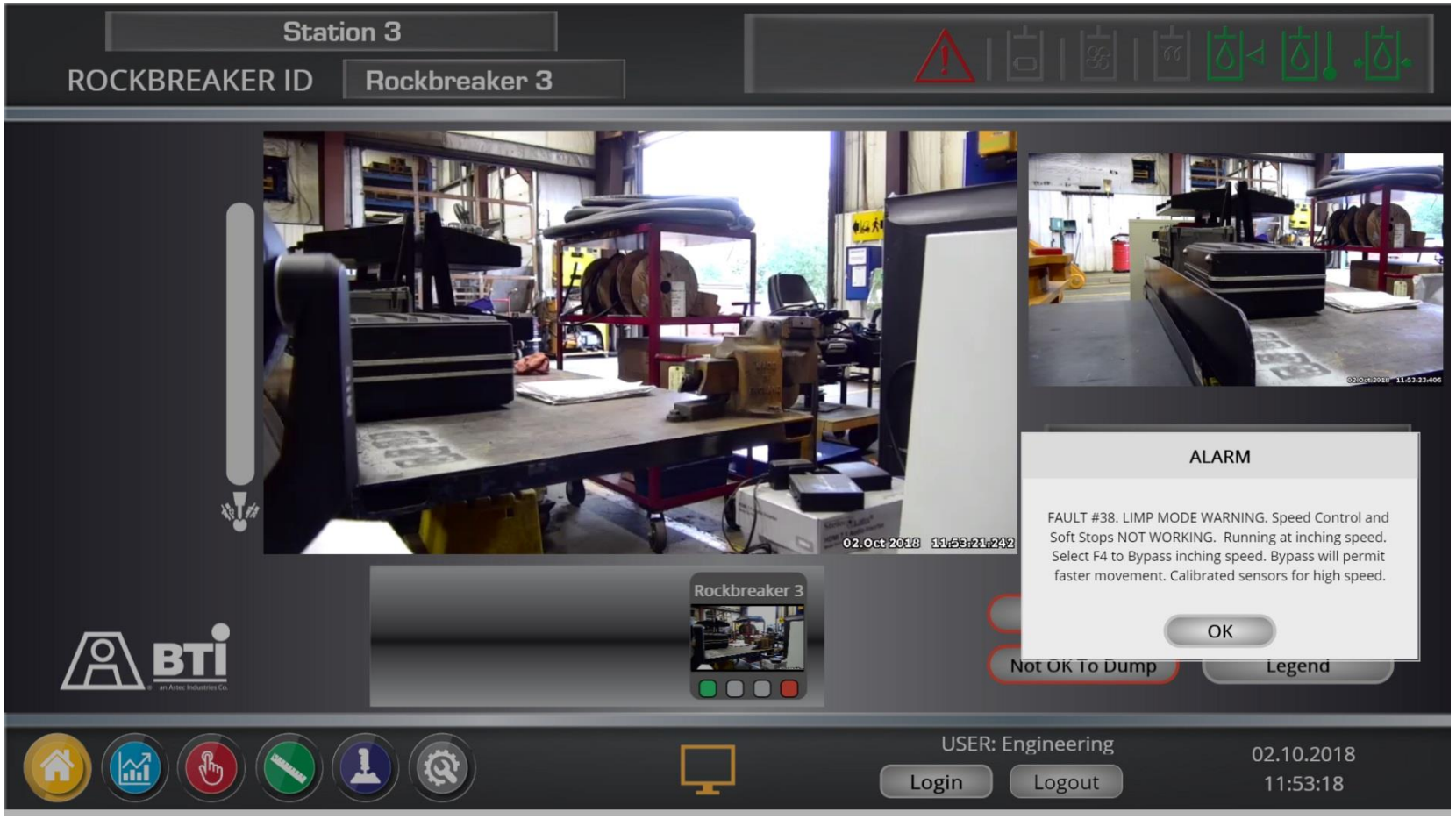
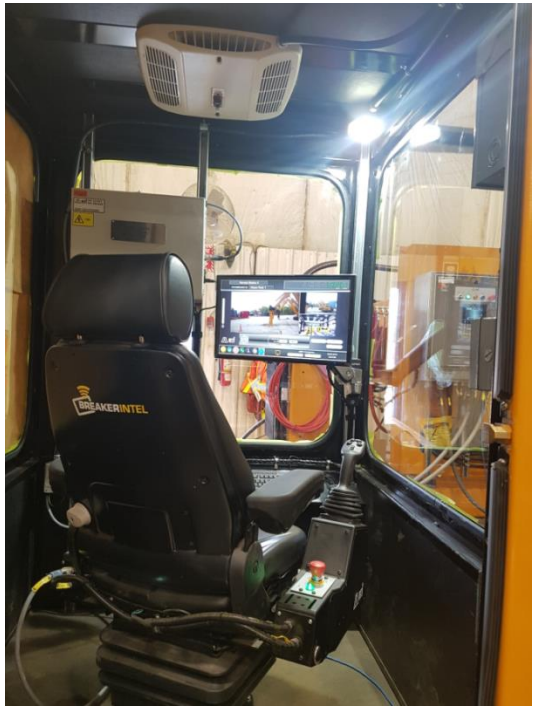

Station 3
ROCKBREAKER ID
Rockbreaker 3
JOYSTICKS
Not In Use
Not In Use
HMI Mode / PTZ Control
Rockbreaker Mode
Not In Use
Not In Use
Not In Use
Select
Select
Horn
BTI
USER: Engineering
Login
Logout
02.10.2018
11:44:39

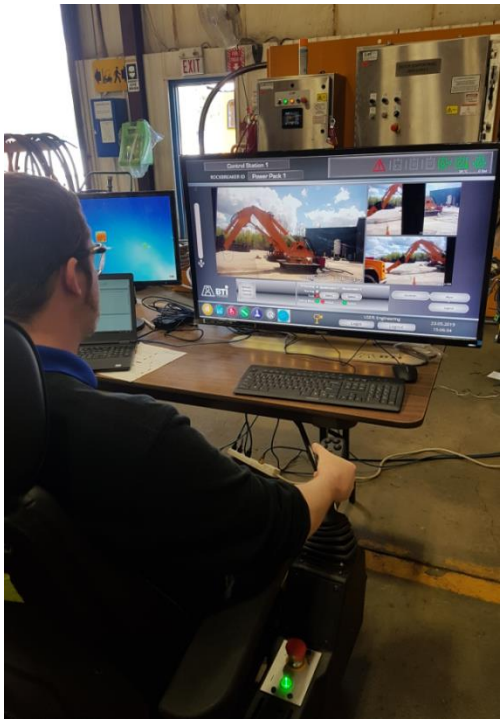

Station 3
ROCKBREAKER ID
Rockbreaker 3
02.Oct 2018 11:53:21.242
ALARM
FAULT #38. LIMP MODE WARNING. Speed Control and Soft Stops NOT WORKING. Running at inching speed. Select F4 to Bypass inching speed. Bypass will permit faster movement. Calibrated sensors for high speed.
OK
Rockbreaker 3
Not OK To Dump
Legend
USER: Engineering
Login
Logout
02.10.2018
11:53:18

OPERATOR STATIONS

Underground Cab Solutions



Remote Station



QUESTIONS?